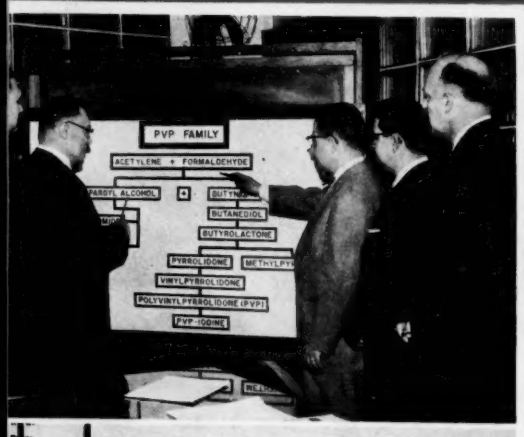
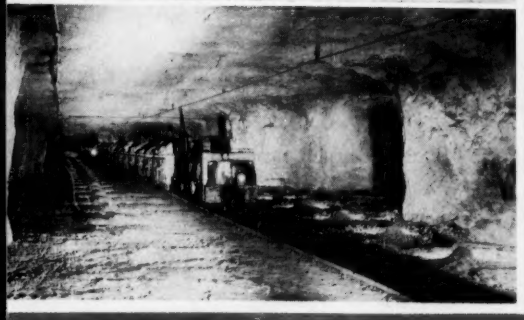
C W Report

Chemical Week

March 17, 1956

Price 35 cents





Coatings—could you get a bigger slice of this $700-million market for chemicals? . . . . . p. 70

GAF planners put pressure on acetylene. Result: new family of commercial chemicals . . . p. 90

Chemical earnings: latest roundup finds them at record levels again, and still climbing . . . . . p. 22

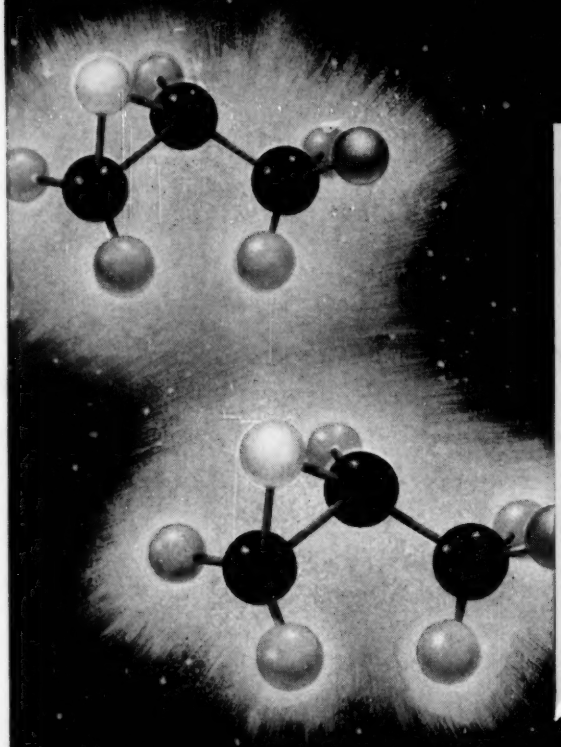
How McKesson & Robbins got to be the world's biggest chemical distributor . . . . . p. 110

More lime is dug for chemical use than for agriculture and building trades combined . . . . . p. 132

A McGRAW-HILL PUBLICATION

Getting the most out of...

EPICHLOROHYDRIN?



Where Shell Chemical Epichlorohydrin excels—

epoxy resins
adhesives
plasticizers
polymers
stabilizers
surfactants
dyestuffs
cosmetics
pharmaceuticals
surface coatings

Fifteen years ago, Shell Chemical pioneered the commercial production of high-purity epichlorohydrin. Since then, a series of important industrial products have been derived from "Epi."

Long experience and quality-controlled production facilities make *Shell Chemical the foremost supplier of high purity epichlorohydrin*, serving both small and large users. Your Shell Chemical representative will gladly explain the benefits in service that are yours when you order from Shell.

Write for Technical Booklet SC: 49-35, *Epichlorohydrin*—a worth-while addition to your permanent reference shelf.

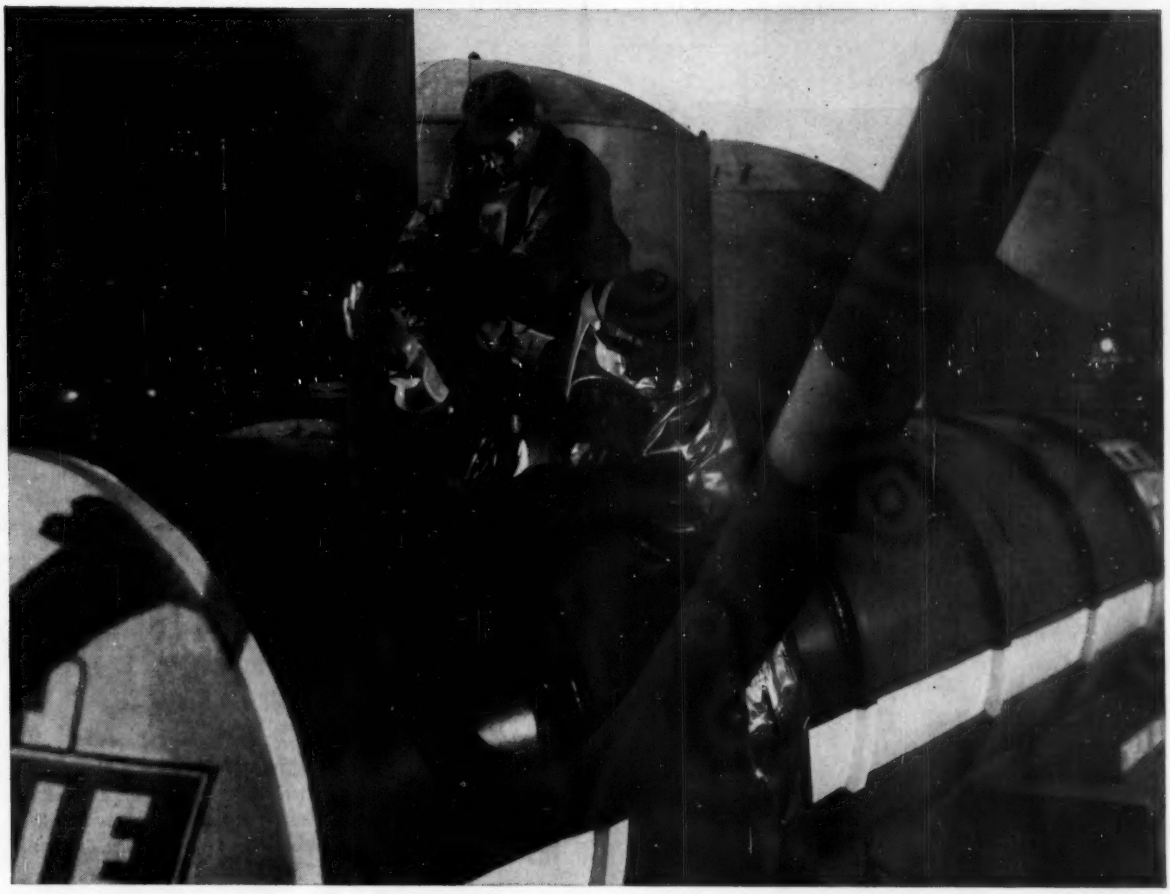
SHELL CHEMICAL CORPORATION

CHEMICAL PARTNER OF INDUSTRY AND AGRICULTURE

380 Madison Avenue, New York 17, New York

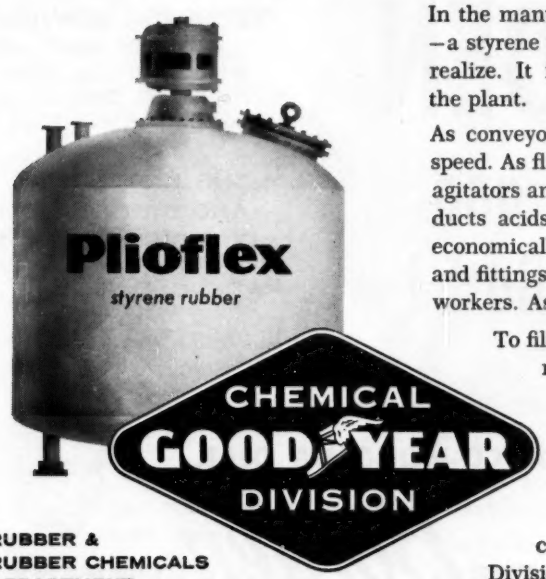
Atlanta · Boston · Chicago · Cleveland · Detroit · Houston · Los Angeles · Newark · New York · San Francisco · St. Louis

IN CANADA: Chemical Division, Shell Oil Company of Canada, Limited · Montreal · Toronto · Vancouver



How much does $[C_{12}H_{14}]_n$ add to every chemical compound?

(synthetic rubber)



In the manufacture of virtually every chemical compound, $[C_{12}H_{14}]_n$ —a styrene type synthetic rubber—adds much more than most people realize. It is indispensable to the vital flow of materials through the plant.

As conveyor belting, synthetic rubber hauls bulk materials at high speed. As flat belts and V-belts, it drives crushers, compressors, mills, agitators and dryers, quietly and dependably. As hose and pipe, it conducts acids, alkalies, gases, steam, slurries and wastes, safely and economically. As linings and coverings, it protects tanks, pumps, pipe and fittings against corrosion and abrasion. As clothing, it safeguards workers. As molded goods, it seals and keeps equipment working.

To fill the many demands of the chemical industry for synthetic rubber in many forms, Goodyear supplies PLIOFLEX—a family of styrene rubbers for general use—and CHEMIGUM—a family of nitrile rubber for use where oil-resistance is required—plus complete data and technical assistance on their proper application.

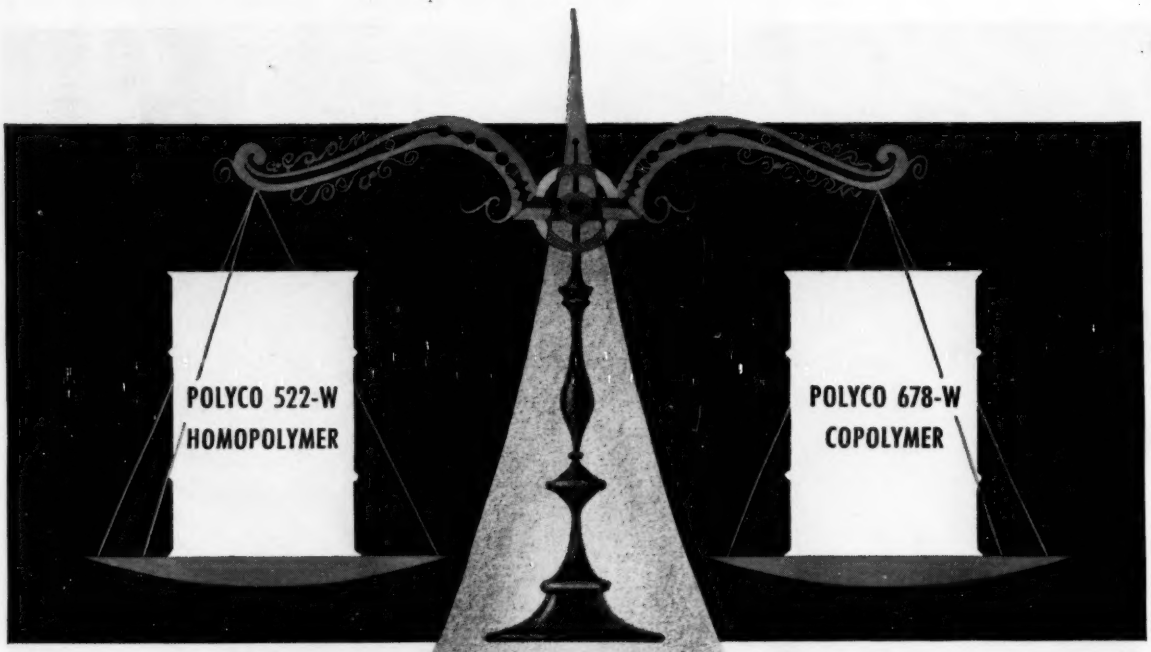
Full details on how or where PLIOFLEX and CHEMIGUM can help you are yours by writing to: Goodyear, Chemical Division, Dept. D-0416, Akron 16, Ohio.

RUBBER & RUBBER CHEMICALS DEPARTMENT

Chemigum, Plioflex, Pliolite, Plio-Tuf, Pliovic—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

CHEMIGUM • PLIOFLEX • PLIOLITE • PLIO-TUF • PLIOVIC • WING-CHEMICALS

High Polymer Resins, Rubbers, Latices and Related Chemicals for the Process Industries



Still weighing their advantages for your paint formulation?

BORDEN

Knows and Makes Both!

Borden offers you an Internally Plasticized Copolymer (POLYCO 678-W) and a Fine Particle Size Homopolymer (POLYCO 522-W) . . . both vinyl acetate emulsions designed specifically for the paint industry. They can be formulated into high quality, freeze-thaw stable paints in a complete range of colors, with PVCs up to 60% for maximum economy. Superior mechanical and chemical stability have been incorporated into these emulsions to insure ease of manufacture in conventional paint equipment.

PLUS

1 PROMPT DELIVERY from plants in Peabody and Leominster, Massachusetts; Bainbridge, New York; Illiopolis, Illinois and Dominguez, California.

2 PREPLASTICIZING SERVICE on Homopolymers.

3 PROMPT, EXPERT TECHNICAL SERVICE by qualified paint chemists, with laboratories in Peabody, Philadelphia, New York, Chicago and Los Angeles.

4 THE KNOW-HOW AND EXPERIENCE of the only producer of all types of resin emulsions and latices used in Water Base Paints.

If you are making, or contemplate making, resin emulsion paints or primer sealers,
IT WILL PAY YOU TO CONSULT US.

POLYCO-MONOMER DEPT.

THE *Borden* COMPANY
CHEMICAL DIVISION
350 MADISON AVE., NEW YORK 17, N. Y.

Chemical Week

TOP OF THE WEEK **March 17, 1956**

Olin Mathieson will merge no more. It may still buy a company once in a while, but most of its money will be going into expansion .....p. 21

Three-way growth plan for Vick: new products, plant expansions, intensive executive development ..p. 30

Independent commercial labs register substantial income gains, point for bigger role in research .....p. 56

Dry aerosols look like next major step for push-button products, but progress may be slow .....p. 142

8 OPINION

12 UPCOMING MEETINGS

17 BUSINESS NEWSLETTER

22 Record profits in '55; here's how 31 chemical firms ranked

23 Vitro joins Crane to develop rare earth and titanium raw material sources

24 Here's why Baton Rouge is the cynosure of many chemical companies

25 WASHINGTON ANGLES

26 What you can and can't ship behind the Iron Curtain

30 ADMINISTRATION

34 Chemical unions set date for first premerger meeting, step up activities

36 Lots of recreation for employees, little cost to company

38 U.S. firms stick to on-the-job training, but ICI sets up full-time apprentice program

51 CHARTING BUSINESS

56 RESEARCH

58 High-intensity arc: new way to get scarce metals

60 New antiozidants bid for $50-75-million market

68 TARGET

Big potential for electroluminescent phosphors in interior lighting

70 CW REPORT

90 PRODUCTION

GAF's Calvert City plant: U.S. debut of commercial high-pressure acetylene derivatives

98 Process economics hold spotlight at 33rd National meeting of AIChE

105 TECHNOLOGY NEWSLETTER

110 DISTRIBUTION

What's behind phenomenal growth of McKesson & Robbins' chemical network

118 Ferro cheerfully gives away its hard-won technical help

132 MARKETS

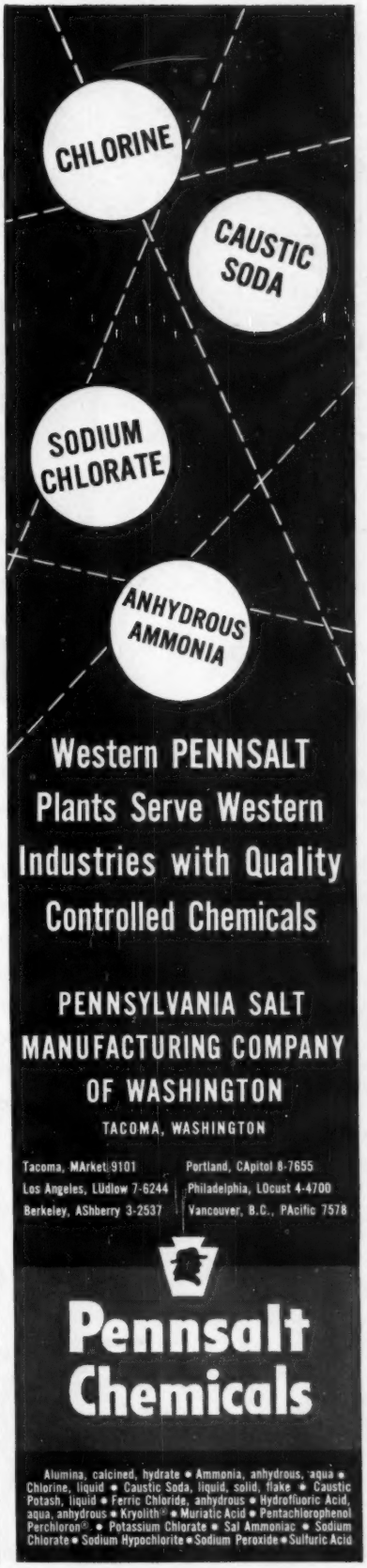
Chemical outlets top all others in 11-million-tons/year lime industry

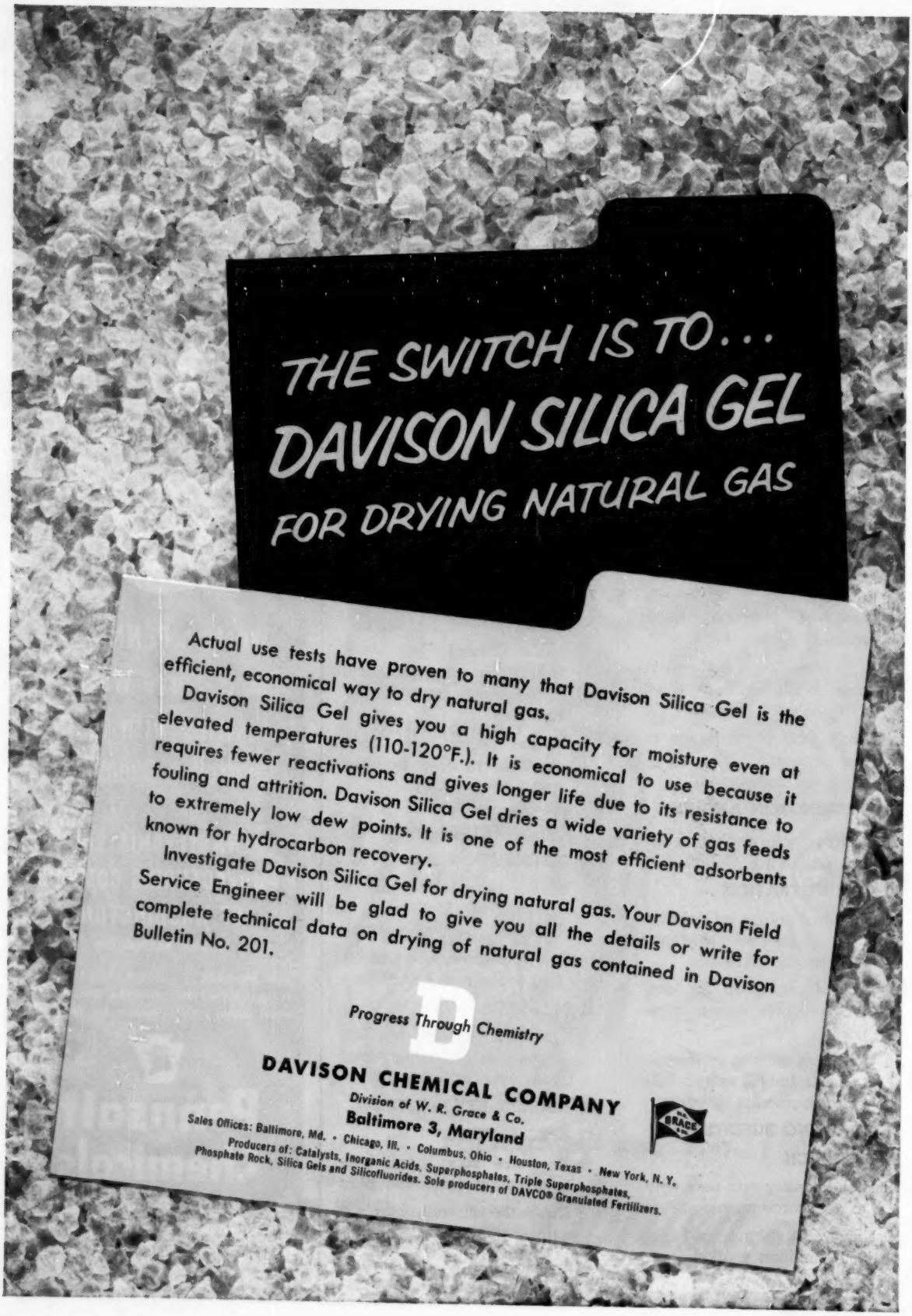
139 MARKET NEWSLETTER

142 SPECIALTIES

146 Hotel-size soap bars: self-supporting promotion plan

148 Down the oil well, there's a major market for specialty cements


CHLORINE
CAUSTIC SODA
SODIUM CHLORATE
ANHYDROUS AMMONIA
Western PENNSALT Plants Serve Western Industries with Quality Controlled Chemicals
PENNSYLVANIA SALT MANUFACTURING COMPANY OF WASHINGTON
TACOMA, WASHINGTON
Tacoma, MArket 9101
Portland, CApitol 8-7655
Los Angeles, LUdlow 7-6244
Philadelphia, LOcust 4-4700
Berkeley, AShberry 3-2537
Vancouver, B.C., PAcific 7578
Pennsalt Chemicals
Alumina, calcined, hydrate • Ammonia, anhydrous, aqua • Chlorine, liquid • Caustic Soda, liquid, solid, flake • Caustic Potash, liquid • Ferric Chloride, anhydrous • Hydrofluoric Acid, aqua, anhydrous • Kryolith® • Muriatic Acid • Pentachlorophenol Perchloron® • Potassium Chlorate • Sal Ammoniac • Sodium Chlorate • Sodium Hypochlorite • Sodium Peroxide • Sulfuric Acid


THE SWITCH IS TO...
DAVISON SILICA GEL
FOR DRYING NATURAL GAS
Actual use tests have proven to many that Davison Silica Gel is the efficient, economical way to dry natural gas.
Davison Silica Gel gives you a high capacity for moisture even at elevated temperatures (110-120°F.). It is economical to use because it requires fewer reactivations and gives longer life due to its resistance to fouling and attrition. Davison Silica Gel dries a wide variety of gas feeds to extremely low dew points. It is one of the most efficient adsorbents known for hydrocarbon recovery.
Investigate Davison Silica Gel for drying natural gas. Your Davison Field Service Engineer will be glad to give you all the details or write for complete technical data on drying of natural gas contained in Davison Bulletin No. 201.
Progress Through Chemistry
DAVISON CHEMICAL COMPANY
Division of W. R. Grace & Co.
Baltimore 3, Maryland
Sales Offices: Baltimore, Md. • Chicago, Ill. • Columbus, Ohio • Houston, Texas • New York, N. Y.
Producers of: Catalysts, Inorganic Acids, Superphosphates, Triple Superphosphates, Phosphate Rock, Silica Gels and Silicofluorides. Sole producers of DAVCO® Granulated Fertilizers.
GRACE

Chemical Week

March 17, 1956 *Vol. 78, No. 11*

Publisher ..... Wallace F. Traendly
Editorial Director ..... Sidney D. Kirkpatrick
Executive Editor ..... Howard C. E. Johnson
Associate Managing Editors ..... Ralph R. Schulz
Edward T. Thompson

ASSOCIATE EDITORS

Marketing ..... Anthony J. Piombino
Technology ..... Donald P. Burke

DEPARTMENTS

Administration .. Homer Starr, *editor;* Cooper McCarthy, Jan Snaauw
Business News ..... William Olcott, *editor;* Vincent L. Marsilia, Robert L. Porter
Marketing
Markets ..... Jorma Hyypia, *editor*
Distribution ..... John M. Winton, *editor;* Richard J. Callahan
Reports ..... Michael L. Yaffee, *editor*
Specialties ..... J. R. Warren, *editor;* Charles Joslin
Technology
Production ..... Kenneth Wilsey, *editor*
Research ..... Joseph F. Kalina, *editor;* Emil Mikity
Copy ..... William Mullinack, *editor*
Art ..... Donald R. Thayer, *director*
Buyers' Guide ..... Alvin J. Babkow, *manager*

REGIONAL EDITORS

Midwest .... Frank C. Byrnes, Chicago
Southwest ..... James A. Lee, Houston
Far West .. Elliot Schrier, San Francisco

EDITORIAL ASSISTANTS

Virginia Clark — Magnhild Lovaas
Peter Madden — Kay Sebiry
Eleanor Sternecker — Frances Regan

NATIONAL NEWS

Economics .. Dexter M. Keezer, *director*
Douglas Greenwald, Robert P. Ulin
Atlanta ..... A. R. Henry
Cleveland ..... Robert E. Cochran
Detroit ..... Harry Homewood
Los Angeles ..... John Shinn
San Francisco ..... Margaret Ralston
Washington ..... George B. Bryant, Jr.

Correspondents in 73 principal cities.

WORLD NEWS

Editor ..... John Wilhelm
London ..... William J. Coughlin
Paris ..... John O. Coppock
Bonn ..... Gerald W. Schroder
Rio de Janeiro ..... Peter Weaver
Mexico City ..... John H. Kearney
Tokyo ..... Dan Kurzman
Bombay ..... Gordon Graham

Correspondents in 44 principal cities.

Advertising Director ..... Robert S. Muller

Advertising Sales Manager Steven J. Shaw
Business Manager .. Anton J. Mangold
Advertising Salesmen .... See page 156

Promotion Manager .. E. A. Atwood, Jr.
Market Research Manager A. I. Losick
Market Service Manager .. J. E. Zingale

Chemical Week (including Chemical Specialties and Chemical Industries) is published weekly by McGraw-Hill Publishing Company, Inc. James H. McGraw (1860-1948), founder. Executive, Editorial and Advertising Offices: McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y. Publication Office: 1309 Noble St., Philadelphia 23, Pa. Donald C. McGraw, President; Paul Montgomery, Executive Vice-President; Joseph A. Gerardi, Vice-President and Treasurer; John J. Cooke, Secretary; Nelson Bond, Executive Vice-President, Publication Division; Ralph B. Smith, Vice-President and Editorial Director; Joseph H. Allen, Vice-President and Director of Advertising Sales; J. E. Blackburn, Jr., Vice-President and Circulation Director.

Subscriptions to Chemical Week are solicited from management men in the chemical process industries. Position and company connection must be indicated on subscription order. Address all subscription communications to Chemical Week Subscription Service, 330 W. 42nd St., New York 36, N.Y., or 1309 Noble St., Philadelphia 23, Pa. Allow one month for change of address.

Single copies, 35¢ except Annual Buyers' Guide issue, priced at $2.50. Subscription rates—United States, United States possessions and Canada, $3.00 a year; $4.00 for two years; $5.00 for three years. Other Western Hemisphere countries, $15.00 a year; $25.00 for two years; $30.00 for three years. All other countries, $25.00 a year; $40.00 for two years; $50.00 for three years.

Second class mail privileges authorized at Philadelphia, Pa.

Copyright 1956 by McGraw-Hill Publishing Co. Inc. All rights reserved.

It's better

to get it from

Eastman . . .

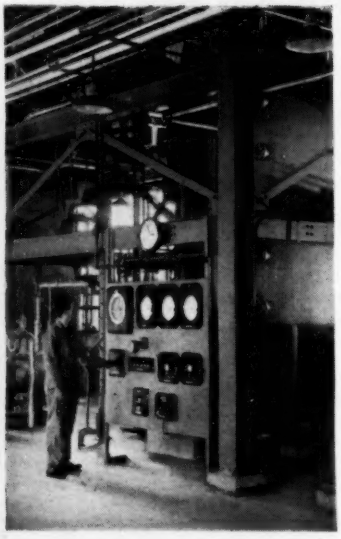
Sure, when you need an uncommon organic (or an uncommonly pure one) in more-than-test-tube and less-than-tank-car quantities, try Eastman Organic Chemicals Department, *Distillation Products Industries,* Rochester 3, N. Y.

DPi

there are some 3500 Eastman Organic Chemicals for science and industry

DISTILLATION PRODUCTS INDUSTRIES
is a division of
EASTMAN KODAK COMPANY

To help you in the transition from research to production *Look for this Cap Seal*



You're a step ahead when the purity and specifications of the laboratory chemicals used in your research are available in tonnage for process use. You can move confidently from laboratory and pilot studies to full commercial production.

More than 200 Baker laboratory chemicals are also supplied in tonnage quantities for production use. These chemicals in bulk quantities are economically priced, and their use frequently eliminates costly purification steps in your process.

Your research, development and production teams can quickly identify the Baker laboratory chemicals available in process quantities. A new cap seal will carry the statement "This chemical available in bulk for production use." Other Baker laboratory chemicals will be identified by a similar seal as their bulk applications become established.

You are already benefiting from the actual lot analyses and actual lot assays on the Baker label. This new cap seal is another "plus value"—a part of Baker's continuing program for more informative labelling of chemicals.

Baker laboratory chemicals play an important part in your research and development program. Let them help you translate your research success into a production success.

J. T. BAKER CHEMICAL CO.
Executive Offices, Phillipsburg, N. J.

Baker CHEMICAL

Baker Chemicals
REAGENT • FINE • INDUSTRIAL

To help you know the process chemicals Baker supplies in tonnage quantities...

Look at these Charts!

When you need process chemicals in tonnage quantities, the two charts reproduced on this page will show you, at a glance, many of the chemicals and grades supplied by Baker.

Each chart provides an easy-to-use, time-saving reference guide showing which light and heavy metal compounds are presently available *by the ton* or *by the carload*.

Like all Baker industrial chemicals, these metal compounds are products of precise Baker manufacturing skills. The controlled purity and uniformity of these chemicals — and their economy — make them the ideal choice for production use.

If chemicals you need are not listed, or if the required grade is not shown, perhaps we can produce to your specification. We are glad to do this when quantities are sufficient for economic manufacture.

Many of the chemicals on these charts are among the 200 Baker *laboratory* chemicals which bear the special cap seal reading *"This chemical available in bulk for production use."*

Baker can supply these LIGHT METALS (or cations) IN THESE FORMS →

	Ammonium	Sodium	Potassium	Magnesium	Calcium	Strontium	Barium	Lithium
Fluoride (Bifluoride)	R (Bi)	R	R		R	PR	R	TPR
Chloride	PR	PR	PR	TPR	PR	R	PR	TPR
Bromide	PR	PR	PR		P	P		P
Bromate		PR	PR					
Iodide	R	PR	PR		R			
Sulfide	TR	PR						
Sulfite (Bisulfite)	R (Bi)	PR	P					
Sulfate	PR	PR	PR	PR	R		R	TR
Bisulfate		R	TR					
Persulfate	PR		R					
Nitrate	TPR	PR	R	TPR	TPR	PR	TPR	TPR
Phosphate	PR	R	PR	P	R			
Carbonate	R	R	R	TPR	R	R	R	TPR
Bicarbonate	R	R	PR					
Thiocyanate	TPR	PR	TPR		P			
Acetate	PR	PR	PR	R	PR		PR	
Oxalate (Binoxalate)	PR		TPR (Bi)					
Borate	P	R	P					
Dichromate	PR		PR					
Molybdate	PR	TR						
Hydroxide	PR	PR	PR	P	PR	P	R	T
Miscellaneous		CYANIDE R; SALICYLATE PR; BISMUTHATE R; STANNATE R; TUNGSTATE R	FERRICYANIDE PR; FERROCYANIDE PR; CHROMATE PR	TRISILICATE P; OXIDE PR; SILICATE P				

KEY TO CHART: T—Technical Quality; P—Purified, U.S.P., or N.F. Quality; R—Reagent Quality. Black —Carloads; Gray —Tonnage

LIGHT METAL COMPOUNDS

Baker can supply these METALS — in these forms →

	Chloride	Bromide	Sulfate	Nitrate	Phosphate	Carbonate	Acetate	Chromate	Oxide	Miscellaneous	
Chromium	R		R	R			R		R	LIGHT METAL CHROMATES:	PR
Molybdenum									R	SODIUM & AMMONIUM MOLYBDATES:	TPR
Manganese	R		PR	R		R			PR		
Iron (Ferric)	R		R	PR						HYDROXIDE:	P
Iron (Ferrous)			PR							FERROUS AMMONIUM SULFATE:	PR
Cobalt	PR		PR	PR		R	R		R		
Nickel	PR		R	PR		R	R		R	NICKEL AMMONIUM SULFATE:	R
Copper	PR	R	R	TPR		R	R		R		
Zinc	PR	PR	PR	TR	P	R	TR	P	R		
Cadmium	PR		PR	R		R	R		R	IODIDE:	R
Mercury	PR		PR	PR			PR		TPR	IOBIDE:	R
Aluminum	R		PR	TPR	P		R		R	HYDROXIDE:	PR
Tin (Stannic)	PR									SODIUM STANNATE:	R
Tin (Stannous)	TR								R		
Lead	TR		R	TPR		R	TPR	R	TPR	THIOCYANATE:	P
Bismuth	R			PR					R	OXYCHLORIDE:	R
Bismuth (Sub)				P		P				SUBGALLATE:	P

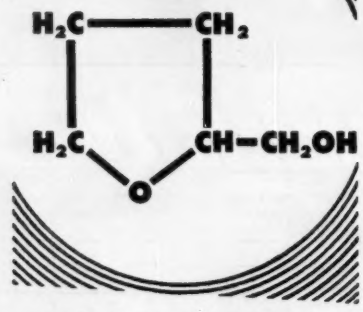
KEY TO CHART: T—Technical Quality; P—Purified, U.S.P., or N.F. Quality; R—Reagent Quality. Black —Carloads; Gray —Tonnage

HEAVY METAL COMPOUNDS

FREE Reference File— Baker Process Chemicals:

This convenient letter-size folder contains a complete set of availability charts and price schedules for Baker Process chemicals—keeps them at your finger tips. For your copy, write: J. T. Baker Chemical Co., Phillipsburg, N. J.

QUAKER OATS
THFA



Tetrahydrofurfuryl alcohol (THFA*) undergoes the reactions of a primary alcohol while the ring exhibits characteristics of a saturated cyclic ether.

THFA is the starting point for the preparation of high boiling tetrahydrofurfuryl esters and ethers. As a ring compound it may be opened to give straight chain compounds, or expanded to a six-membered ring as dihydropyran.

Solvent uses of THFA have attracted attention. As a solvent its high boiling point coupled with complete miscibility with water makes it unique. Its solvency for resins, gums, dyes and complex organic compounds is excellent. When using THFA as a solvent, saving of time in dissolving material and ready recovery of the THFA may more than offset its higher initial cost compared to cost of other solvents. *Reg. U. S. Pat. Off.

THFA
is commercially available in drum and tank cars.

Properties of THFA (Pure Compound)

Boiling Point °C, (747 mm)	177.8
Specific Gravity, 20/20 C	1.054
Refractive Index, n 20/D	1.452
Water Solubility	Complete

Send for a sample of tetrahydrofurfuryl alcohol and our Bulletin 87.

The Quaker Oats Company
CHEMICALS DEPARTMENT
3346 The Merchandise Mart, Chicago 54, Illinois
Room 534G, 120 Wall St., New York 5, N. Y.
Room 434G, 3000 N. Going St., Portland 11, Oregon

In Europe: Quaker Oats-Graanproducten N. V., Rotterdam, The Netherlands; Quaker Oats (France) S. A., 3, Rue Pillet-Will, Paris IX, France; A/S "Ota" Copenhagen, S. Denmark
In Australia: Swift & Company, Pty., Ltd., Sydney
In Japan: F. Kanematsu & Co., Ltd., Tokyo

OPINION. . . . . .

Add Associated

DEAR MR. JOHNSON: We commend you for your article "New Spirit of St. Louis: Civic, Industrial Rebirth" (*Feb. 25*).

We were disappointed to find the names of our affiliate, the Wood-Treating Chemicals Co., one of the largest producers of penta (pentachlorophenol) wood preservatives in the world, and that of Associated Sales & Supply Co., manufacturers of a host of insecticides, herbicides and industrial chemicals, omitted from the "chemical who's who."

The enclosed pictures of our respective operations, at 5137 Southwest Ave. and 5 Convent St., will give some idea of the magnitude of our chemical operations in St. Louis.

EDMUND C. HYRY
Vice-President
Associated Sales & Supply Co.
St. Louis, Mo.

Angle on Dugway

DEAR MR. SCHRIER: Regarding the very excellent CW Report, "Your Future in Nuclear Energy" by Ray E. Heiks and colleagues in the current issue of CHEMICAL WEEK, there is one error that didn't set too well with local subscribers.

Please put the Dugway Proving Grounds back in Utah instead of Idaho, which already has the reactor testing station.

JACK E. JARRARD
Business Editor
Deseret News
Salt Lake City, Utah

From New York, the misplacement subtends a very small angle; from Salt Lake City, we concede, the angle is far greater.—ED.

Magazines for Friendship

GENTLEMEN: The enclosed circular explains a plan (Magazines for Friendship) that should be helpful in promoting goodwill for the U.S.A. and in explaining our way of life to other countries. I have been using it for several months and have sent copies of CHEMICAL WEEK to the departments of chemistry of various universities.

Your issue of Feb. 18 has two excellent articles that should show readers in foreign countries how American business and private enterprise promote education and pension benefits without government restrictions, regulations and standardization. I refer to the articles: "Building a Better Climate," page 32, and "GAW Rejected; Alternates Picked," page 35.

If you have extra copies of that issue, perhaps you might wish to send them to foreign universities or to other people.

STANLEY M. COLE
Albany, Calif.

The enclosed circular says, in part:

"Enlist in a nationwide campaign to win lasting peace by counteracting Communist propaganda and other forms of anti-American propaganda through spreading the truth about America around the world with your used magazines. It is vitally important to promote understanding and respect for this country, and you can play an effective role by adopting the Magazines for Friendship plan.

"Our predicament, and that of every free man in the world, is summed up in a few sentences from Paul G. Hoffman's book, 'Peace Can Be Won':

" 'As a leader of the free world, the U.S. must by deeds and words make clear to all peoples our devotion to the ideal of a free, peaceful and more ample life for all men.

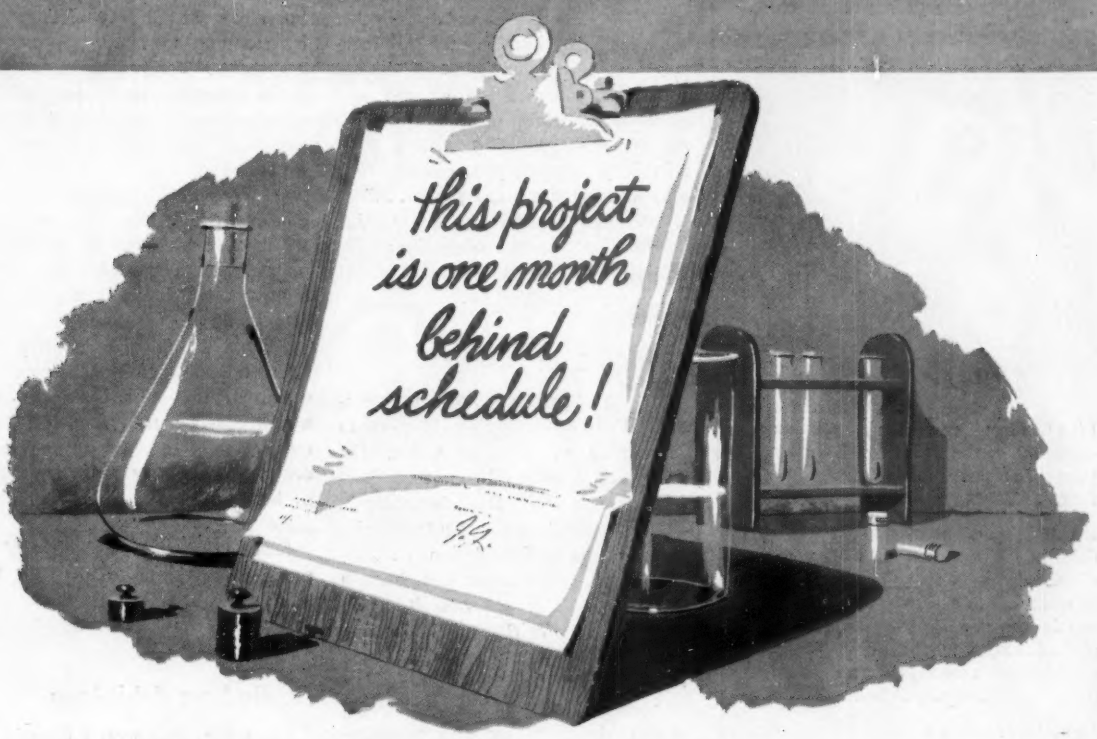
" 'If we see this propaganda program for what I think it should be—and what our opponents have made it—namely, a major instrument of national policy, then we must give it the standing and support it deserves . . . For the battle to win a country through the minds, hearts and loyalties of its people will always be an infinitely cheaper battle than that which has to be won by armies—as the Kremlin has so spectacularly proven.

" 'We should seek to enlist millions

CW welcomes expressions of opinions from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: H. C. E. Johnson, Chemical Week, 330 W. 42nd St., New York 36, N.Y.

...is this *your* predicament?



• How many projects in *your* laboratory are now behind schedule... either because you lack the needed manpower, or because of overloaded facilities? How many profit-making product innovations are being held back because your laboratory can't find the time to develop them properly?

• *Today, hundreds of companies are circumventing situations like this, by putting their overflow testing and research problems into our hands.*

• At the United States Testing Company you will find diversification as well as specialization among our staff of skilled scientists and technicians. Our laboratories offer you facilities for such tasks as physico-chemical evaluation, chemical analysis, bacteriology, toxicology, engineering and psychometrics. Our services include everything from routine testing, assays and product evaluation to product development, materials engineering, quality control, and sponsored research.

• For over 75 years our facilities have been applied to the solution of laboratory problems of every description... helping companies large and small save time, meet deadlines, and protect quality and profits. Now we can help *you.*

• If the execution of an important project is being held back by the lack of adequate personnel or equipment, or if you have problems in routine testing that are being pushed aside by your special projects — call us today.

• Let the man from the United States Testing Company be *your* man.

Send for your free copy of "Selected Scientific and Engineering Tables and Data." Write Dept. E.

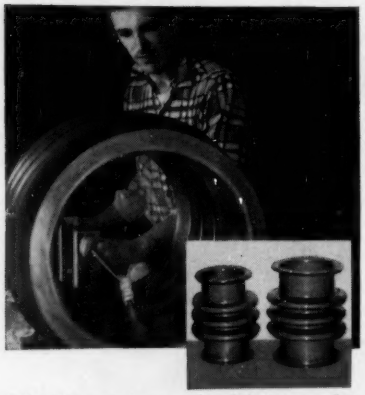
UNITED STATES TESTING COMPANY, INC.

1610 Park Avenue, Hoboken, New Jersey

BOSTON • BROWNSVILLE • DALLAS • DENVER • LOS ANGELES • MEMPHIS
NEW YORK • PHILADELPHIA • PROVIDENCE • SAN ANGELO • WILMINGTON

KEL-F® fluorocarbon DISPERSIONS

for corrosion-resistant... anti-adhesive COATINGS



Like this metal expansion joint, a number of surfaces can be given corrosion-resistant, protective coatings with the new *dispersion* form of KEL-F fluorocarbon plastic.

KEL-F Dispersions are finely divided particles of KEL-F plastic in a volatile medium. They can be applied by spraying, dip, or spreading to a variety of metallic and certain non-metallic surfaces. High-temperature baking fuses the dispersions into tough, adherent coatings that are corrosion-resistant, thermally stable, and anti-sticking.

Thus, fluorocarbon coatings not only protect process equipment from corrosion, but also provide a self-cleaning, non-contaminating surface that insures purity of process stream.

A unique combination of properties of the coatings suggests many areas of use:

CORROSION RESISTANCE – tankcars, piping, pumps, mixers, valves, flowmeters, reactors, containers.

ANTI-STICKING – agitators, calender and guide rolls, forming dies, cone blenders, casting molds.

ELECTRICAL – coated glass tape, distribution transformers, miniaturized stators and relays.

Kellogg will gladly work with you in developing specific applications for KEL-F Dispersions. If you do not maintain your own coating department, we can recommend experienced applicators. Write for more information.

THE M. W. KELLOGG COMPANY
Subsidiary of Pullman Incorporated
Chemical Manufacturing Division
P. O. Box 469, Jersey City 3, N. J.

KELLOGG

® KEL-F is a registered trademark of The M. W. Kellogg Co. for its fluorocarbon products.

of average men and women . . . in a crusade for the free-world doctrine . . .'

"The Magazines for Friendship plan is the simplest, most effective answer to that question. You and every other American can immediately and inexpensively do your dynamic bit to counteract communism abroad and build up American prestige by adopting it—now. And by getting your friends, your club, your church, your school to espouse it as a group . . ."

Interested readers can get further information from Magazines for Friendship, Inc., Occidental College, Los Angeles, Calif.—ED.

What'll You Drink?

TO THE EDITOR: Knowing CHEMICAL WEEK's continuing interest in fluoridation of drinking water, I'm sure you'll want to know that *Consumers' Research Bulletin* recently told its readers how to get a legal brief in opposition to fluoridation. . . .

KENNETH R. BROWN
Detroit, Mich.

Thanks, Reader Brown. Consumers' Research Bulletin, *March '56, says*: ". . . much of the scientific press has gone in for propaganda exclusively for fluoridation rather than presentation of all the scientific facts. Those who are interested in assistance in combating overeager health authorities bent on benefiting a few at the expense of the majority will find useful a legal brief in opposition to fluoridation of public water supplies by W. Cleveland Runyon, available at 25¢ the copy from the Citizens Medical Reference Bureau, Inc., Setauket, Long Island, N.Y."—ED.

Drug Prices Too High?

DEAR SIR: Two news items from recent issues of CHEMICAL WEEK have piqued my interest. You reported in your Feb. 11 issue that the pharmaceutical industry is undertaking an industry-wide public relations project, and you said, ". . . such a program may be necessary to supply the public with an explanation of manufacturers' high drug prices. . . ." Then in your March 10 issue you report on two investigations of high drug prices being undertaken by the Federal Trade Commission, and you say of this undertaking that "it shows the problem that is faced by the drug industry in justifying current price levels to important segments of the public."

It seems to me that the drug industry can make a strong case for itself, but I fear that it may vitiate its case by stooping to irrational, emotional arguments. For example, a propaganda piece put out by one antibiotics manufacturer pointed out that $8 worth of Such-and-Such could prevent a three-day, $50 stay in a hospital. What's the logic of that? Does that prove that the drug in question shouldn't cost, say, $6 or $4? It's reasoning like this that can do the industry more harm than good in the eyes of thinking people.

Rather should the industry drive home the facts of high research and development costs, the unlikelihood of a new drug's ever getting to the commercial stage, and the rapid obsolescence of most new commercial drugs as better ones are discovered to replace them.

Since I write as an individual and not as a spokesman for my firm, I ask that you withhold my name.

NAME WITHHELD

Addled on Additives

DEAR MR. JOHNSON: I thought you might want your readers to know that half-truths . . . are still being bandied about chemical food additives. . . . Drew Pearson is making the statements this time . . .

FRANK R. YATES
Chicago

Excerpts from Mr. Pearson's column: "Few housewives know it, but a dubious chemical that comes from petroleum is still used as a 'freshener' in rolls, cookies and other bakery products—though its use in bread has been banned. Called polyoxethelene [*sic*] monostearate, its use in bread was fought successfully by the Food & Drug Administration three years ago. But it's still used to fashion other bakery products because of complicated legal procedures that hamper FDA in protecting the public. . . .

". . . during the last 15 years, approximately 25,000 . . . chemicals have been screened by manufacturers, of which 24,600 have been discarded as unsafe. Moreover, of the 400 now in use, it is estimated that 150 have never received adequate testing. Polyoxyethelene [*sic*] monostearate is just one example."—ED.

The "Precious Plus" that didn't appear on the Blueprints

You *see* reactors, vessels, towers and piping — and they have the familiar look of any other Paraxylene and Udex plant. But what you *don't see* — what blueprints cannot show — is the "Precious Plus" that earmarks this "a BMC project".

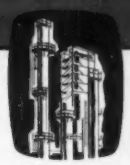
At the time BMC was awarded the design and construction contract, the client had *firm* commitments to ship paraxylene within a fixed time period . . . a time period that would require tight scheduling — even for *conventional* design and construction.

But there was nothing ordinary about *this* Paraxylene plant. It called for a unique crystallizing process — developed by BMC but never before used — that would require time-consuming creative engineering.

Working under almost prohibitive time pressures, a BMC Task Force — with the *Key Man* + in charge — tackled the job. There was no waste motion in engineering. Drafting geared itself to a back-breaking schedule. Equipment orders were placed early. Usual "bugs" were anticipated — and avoided.

The plant went "on-stream" ahead of the client's *fixed* schedule . . . and first shipments were on their way well in advance of the contract commitments. Cost? Substantially below the estimate despite the emphasis on speed.

You can't see it . . . you pay nothing for it . . . but the "Precious Plus" included in this project is a part of every BMC proposal. Many leading petroleum and petrochemical companies have found it a distinct advantage in getting better plants, faster and at a lower cost. How else explain the unusual growth BMC is enjoying?



The Udex and Paraxylene Plants described here were designed and constructed for Sinclair Refining Company, Marcus Hook, Pa.

\+ BMC's *Key Man* operation is unique among major contract engineering firms. The BMC man who submits your proposal is *always* a BMC principal . . . *always* the Key Man heading up the Task Force responsible for the execution of your job. Clients tell us "This is the BMC difference that makes the difference."

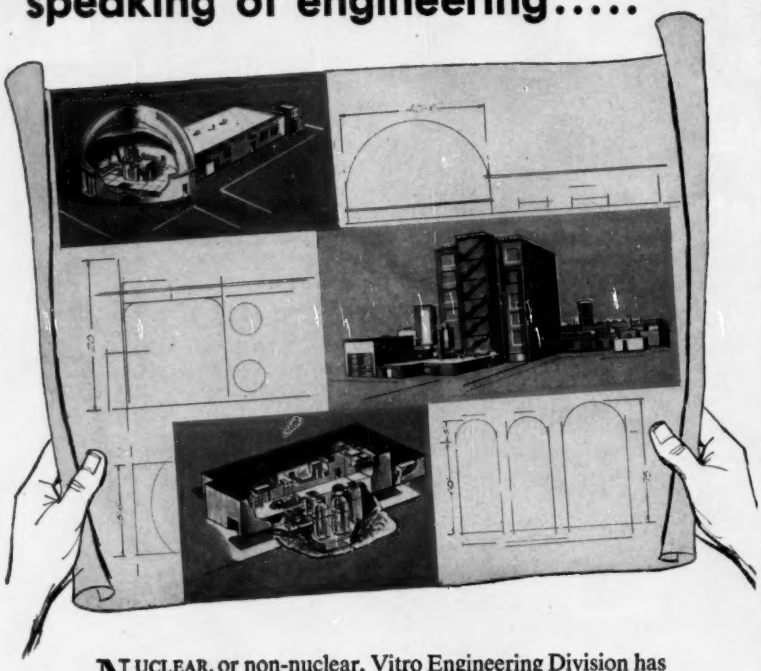
BMC

BADGER MANUFACTURING COMPANY

230 Bent Street, Cambridge 41, Mass.
60 East 42nd Street, New York 17, New York

ENGINEERS • CONTRACTORS • DESIGNERS • MANUFACTURERS

speaking of engineering.....



NUCLEAR, or non-nuclear, Vitro Engineering Division has created outstanding records in the engineering, design and construction of the newest and best in technical facilities for industry and government.

IN THE NUCLEAR FIELD

Vitro is across the map in atomic energy. Whether scoping a heavy water plant in India, working on Consolidated Edison's full-scale power reactor or designing atomic facilities for Lockheed's nuclear-aircraft project, you'll find Vitro engineers at work.

Vitro, in nuclear engineering since 1942, has designed and built facilities for uranium isotope separation (Oak Ridge), plutonium production (Hanford), uranium milling and refining (Salt Lake City and Canonsburg), hot laboratories, and processing plants.

IN OTHER FIELDS

Vitro has designed and built nerve gas installations for the Army, armament test facilities for the Air Force, and for private industry the country's largest titanium production plant, processing plants, including a sugar refinery, acrylonitrile plant, and ore and mineral production works.

Wherever plans are afloat for difficult engineering projects, it's a good bet Vitro engineers are there. May we discuss your engineering problems?

Write for detailed information to **VITRO ENGINEERING DIVISION**

Vitro **CORPORATION of AMERICA**
261 Madison Ave., New York 16, N.Y.

DIVISIONAL ACTIVITIES

- Research, development, weapons systems
- Nuclear and process engineering, design
- Refinery engineering, design, construction
- Uranium mining, milling, processing, refining
- Rare metals, heavy minerals, fine chemicals
- Ceramic colors, pigments, chemical products

SEE YOU THERE

American Water Works Assn., Southeastern meeting, Bon Air Hotel, Augusta, March 18-21; Illinois meeting, La Salle Hotel, Chicago, March 21-23.

American Institute of Mining & Metallurgical Engineers, reactive metals conference, Hotel Statler, Buffalo, March 19-21.

Society of Plastics Industry, 13th annual Pacific Coast Section Conference, St. Francis Hotel, San Francisco, March 27-April 2.

Material Handling Institute Inc., spring meeting, Edgewater Beach Hotel, Chicago, April 3.

American Chemical Society, 129th national meeting, Dallas, April 8-13.

American Pharmaceutical Mfg. Assn., annual meeting, Boca Raton Club, Boca Raton, Fla., April 9-11.

Midwest Research Institute, symposium for management on applications of analog computers, Hotel Phillips, Kansas City, Mo., April 10-11.

Metal Powder Assn., 12th annual meeting, Hotel Cleveland, Cleveland, April 10-12.

Council for Agricultural & Chemurgic Research, annual conference, Congress Hotel, Chicago, April 10-12.

American Society of Biological Chemists, spring meeting, Atlantic City, April 16-20.

American Institute of Chemical Engineers and **University of Pennsylvania,** 4th annual meeting on "Experience in Industry," Museum Auditorium, Philadelphia, April 17.

American Zinc Institute, 38th annual meeting, Hotel Statler, St. Louis, April 23-24.

American Oil Chemists' Society, Shamrock Hotel, Houston, April 23-25.

Assn. of Consulting Chemists & Chemical Engineers Inc., symposium and banquet, 5:00 p.m., Hotel Belmont Plaza, New York, April 25.

National Sanitary Supply Assn., 33rd annual trade show, Conrad Hilton Hotel, Chicago, April 29-May 2.

Chamber of Commerce of the U.S., 44th annual meeting, Washington, D.C., April 30-May 2.

American Institute of Mining & Metallurgical Engineers, mining and metals branch, regional conference, Olympic Hotel, Seattle, May 3-5.

American Institute of Chemical Engineers, meeting, Roosevelt Hotel, New Orleans, May 6-9.

Chemical Market Research Assn., meeting on "The Chemical Industry—Review and Forecast," Biltmore Hotel, New York, May 14-15.

INTERNATIONAL'S

Niagara Falls Plant

has been producing

CAUSTIC POTASH

for the

industrial chemical market

since 1918

MINERALS International CHEMICALS

FOR ALL INDUSTRIAL USES

LIQUID – Iron free, a clear water-white solution of 45-50%. In tank cars and in returnable and non-returnable 675 lb. drums.

LIQUID – Special low chloride, iron-free grade – 45-50%. In tank cars and in returnable and non-returnable 675 lb. drums.

SOLID – 90%. In 700 lb. drums.

FLAKE – 90%. In 100, 200, and 400 lb. drums.

GRANULAR (BROKEN) – 90%. In 100, 210, and 425 lb. drums.

AMERICAN SELECTED WALNUT – In 100, 210, and 425 lb. drums.

Liquid

CAUSTIC POTASH

MINING

REFINING · MANUFACTURING

CAUSTIC POTASH

CARBONATE OF POTASH

POTASSIUM CHLORIDE

SULFATE OF POTASH

MURIATIC ACID

LIQUID CHLORINE

MAGNESIUM OXIDE

HYDROFLUOSILICIC ACID

There's good reason for you to have confidence in *International* as your source of supply of *Caustic Potash*. For 38 years, International's Niagara Falls plant has been producing *Caustic Potash* with a consistent record of uniformity, quality, and good service. You'll get prompt deliveries and helpful cooperation when you depend on *International* for *Caustic Potash* in the form you require—Liquid, Solid, Flake, Granular, or American Selected Walnut.

POTASH DIVISION

INTERNATIONAL MINERALS & CHEMICAL CORPORATION

GENERAL OFFICES: 20 NORTH WACKER DRIVE, CHICAGO 6

61 Broadway, New York 6 • Midland, Texas

"Aerosol product sales up 100% inside a year" is the report from a San Francisco, California, grocer. All over the country sales volume of aerosol products continues to climb. Sales of your product can climb, too, if you put it in an aerosol package.

"4,416 cans of aerosol paints sold in a year" is reported by a Wayne, Pennsylvania, hardware dealer. A quick demonstration is usually all it takes to sell an aerosol product. You, too, can add new sales success to your product through aerosol packaging.

"348 hair-spray aerosols sold in 2 months." That was a striking sales record to a Westport, Connecticut, druggist familiar with slow-moving conventional hair-set preparations. Your product in an aerosol package can pile up sales records, too.

"Aerosol room deodorants outsell conventional types 2 to 1" is the story from a Cleveland, Ohio, supermarket manager. Ease of use has moved aerosols up the best-seller list for many household and personal products. Aerosol packaging could do the same for your products.

IN AN AEROSOL PACKAGE

Here's how Du Pont can help you apply the sales-sparking aerosol idea to your product

Maybe you've noticed how more and more drug stores, hardware stores and grocery stores are featuring aerosols. At the point of sale, retailers know consumers prefer the aerosol method of dispensing. Time and time again, new sales spark has been added to an old product, and immediate consumer acceptance gained for a new one by putting it in an aerosol package. You can profit, too, by putting your product in an aerosol dispenser.

One of the surest ways to succeed with an aerosol is to call in Du Pont to help you get started. Since the original aerosol insecticide, Du Pont has been in on every major aerosol development. This accumulated experience of laboratory experts and marketing specialists is on tap to help you get started in aerosols, and Du Pont has worked closely with independent fillers to assist them in producing top-quality products.

In aiding you with your aerosol formulation problems, Du Pont can help you select the best "Freon"* propellent for your product. "Freon" propellents are ideal for aerosols, because they are safe—nonflammable, nonexplosive and virtually nontoxic. "Freon" propellents are pure—Du Pont's 25 years' experience manufacturing "Freon" assures the utmost in purity and quality. There is sure to be a "Freon" propellent ideally suited to your aerosol product.

Find out more about aerosol packaging and what Du Pont can do to help you increase consumer acceptance of your product. Mail the coupon below for your copy of the informative booklet "Package for Profit." It's free—mail the coupon today.

KINETIC

FREON

SAFE PROPELLENTS

**"Freon" is Du Pont's registered trademark for its fluorinated hydrocarbon propellents*

DU PONT

REG. U.S. PAT. OFF.

Better Things for Better Living... through Chemistry

E. I. du Pont de Nemours & Co. (Inc.)
"Kinetic" Chemicals Division
Room 2420-13 Nemours Building
Wilmington 98, Delaware

- ☐ Please send me your booklet on aerosol packaging, "Package for Profit."
- ☐ Please send me market-research data on aerosols.
- ☐ I want to learn how I can get technical assistance on aerosols.

*Name*_____ *Position*_____

*Company*_____

*Address*_____

*City*_____ *State*_____

163

NEW TREND IN AMMONIA PLANTS

LUMMUS' 60 T/D UNIT FOR WESTVACO

One of the least expensive ammonia plants ever built went on stream in October 1955 at the South Charleston, West Virginia plant of the Westvaco Chlor-Alkali Division, Food Machinery and Chemical Corporation.

It is a small, automatic unit designed to operate with a labor force of two operators per shift, and produce 60 tons per day of anhydrous ammonia from waste chlorine cell hydrogen. Carefully designed and engineered for low investment and low operating costs, and incorporating all the latest safety features, the plant will have an unusually short payout time.

This small, minimum investment unit may well be the prototype for agricultural and industrial ammonia plants of the future. Because ammonia cannot be shipped over long distances, many such units, properly placed at hydrogen, natural gas, fuel oil and other sources throughout the country, would conveniently serve limited local areas.

Lummus built the plant around existing Westvaco facilities in an extremely confined area (as shown in the above photograph) without interrupting any normal plant operations, yet completed the job ahead of schedule in a brief seven months, with an excellent start-up. Westvaco was pleased with the job all along the line, from idea through operation.

This is one of four ammonia projects by Lummus in the last two years, and adds another to the 700-plus major installations completed by Lummus throughout the world.

May we work with you on your next project?

The Lummus Company, 385 Madison Avenue, New York 17, New York. *Engineering and Sales Offices:* New York, Houston, Montreal, London, Paris, The Hague, Bombay. *Sales Offices:* Chicago, Caracas. *Heat Exchanger Plant:* Honesdale, Pa. *Fabricated Piping Plant:* East Chicago, Ind.

LUMMUS

DESIGNING ENGINEERS AND CONSTRUCTORS FOR THE PETROLEUM AND CHEMICAL INDUSTRIES

Business
Newsletter

CHEMICAL WEEK
March 17, 1956

Take a look at the steel industry for a good indication of what business will be like this year.

It's sure that the results of the steel wage negotiations in June will be as important to the over-all health of the U.S. economy as was President Eisenhower's decision to run again—maybe more so.

The outcome: either a steel strike or a very substantial increase in prices. So build steel inventories now—if you can.

A spring upturn in auto sales will give the demand for metals and metal products its usual seasonal boost just as the issue of strike or hike—in both wages and prices—comes up in steel. Once the new price level has been established, production could slacken. Inventory building will likely stop for a while.

But with consumption of both durable and nondurable goods expected to rise strongly in the final six months of the year, the nation's economic health will be in the pink.

Chemical expansion plans highlight the need for more steel. You can see it in the figures expected to be released late this week by the Commerce Dept. and the Securities & Exchange Commission. They'll show how big the push is for capital spending, and capital spending means a further demand for steel and steel products.

Experts who've been looking over trends in capital goods production say that spending for such equipment is up, forecast a 20% rise in spending for new and modernized plants. And the chemical industry has almost always been above the all-industry average.

Coal chemicals, of course, would be affected by a steel strike. Some price rise would be likely—thus redressing the balance between coal- and petroleum-derived materials.

•

Electro Manganese Corp. stockholders on Monday approved a merger of the firm into Foote Mineral. The merger will be effective this Saturday, but will be final only after the government says it will transfer to Foote a manganese purchase contract it now has with Electro.

Stauffer Chemical and West End Chemical will merge. That's the word from a joint board of directors' meeting. Stauffer, which holds 37% of West End's preferred and 16% of its common, will offer shares of its own stock to other West End shareholders.

If the merger goes through, West End would operate as an autonomous Stauffer division.

•

Pennsalt will sell $15 million worth of debentures. It filed with SEC Monday a registration certificate covering the issue. Net proceeds will be used in a five-year, $55-million expansion program.

Expansion emphasis will be on upgrading Pennsalt's basic chemicals—fluorine and chlorine—via both new processes and new products.

Pennsalt is currently building a multimillion-dollar unit at Calvert City, Ky., for its Isotron aerosol propellents and refrigerants, a unit at Wyandotte, Mich., for high-purity calcium hypochlorite, expanding ammonia production at Portland, Ore., and chlorine at Tacoma, Wash. It is also expanding a fluorospar mine and mill in western Kentucky, and, with Hooker Electrochemical, developing solar-evaporation salt facilities on Great Salt Lake.

Elsewhere on the expansion front—

A $12.5-million ammonia plant will be built at Lake Charles, La., by Petroleum Chemicals, joint subsidiary or Cities Service and Continental Oil. The plant, with a capacity of about 100,000 tons/year, will use by-product hydrogen from Cities Service and Conoco refineries near Lake Charles. Ammonia for fertilizer use will be marketed by Mid-South Chemical (Memphis), which is also jointly owned by the two oil companies.

Diamond Alkali will double perchlorethylene production at its Deer Park, Tex., plant. Completion date: Jan. '57. Also planned: installation of service facilities for future expansion of other chlorinated products. Too, Diamond is expanding 2,4-D production at Newark, N.J., and Des Moines, Iowa, as well as output of DDT at Houston, chlorinated paraffins at Painesville, O., and chloromethanes at Belle, W. Va.

Will American Cyanamid expand its acrylonitrile production at Fortier, La.? The company reports that it hasn't made a decision—but it has applied to the Louisiana board of commerce for tax exemption for such an expansion, and has received a favorable decision.

The company's representative, Duncan Edwards, told the Louisiana board that Cyanamid would spend $39 million to double acrylonitrile capacity to over 100 million lbs./year, thus bringing total plant investment to $80 million.

Shell Chemical, too, received tax exemption for a $15-million expansion at Norco, La. It will install units to make 32 million lbs./year of hydrogen peroxide and 40 million lbs./year of butyl alcohol.

•

Up for Congressional scrutiny: the foreign freight forwarding practices that such blue-chip companies as American Cyanamid, Esso, Socony Mobil, Asiatic Petroleum and Ford have long used.

A special House Merchant Marine subcommittee, in public hearings, found that though many big manufacturers do all or 99% of the work necessary to ship their products overseas, they also designate a freight forwarder/broker firm so it can collect a 1¼% brokerage fee from the ocean carrier. Since, in some cases, the brokerage firm is owned by the manufacturer, the fee might be considered a rebate on freight.

The group is holding further hearings this week, will probably report to Congress later this month. Likely upshot: a recommendation to prevent such manufacturer-owned forwarders from collecting brokerage fees.

•

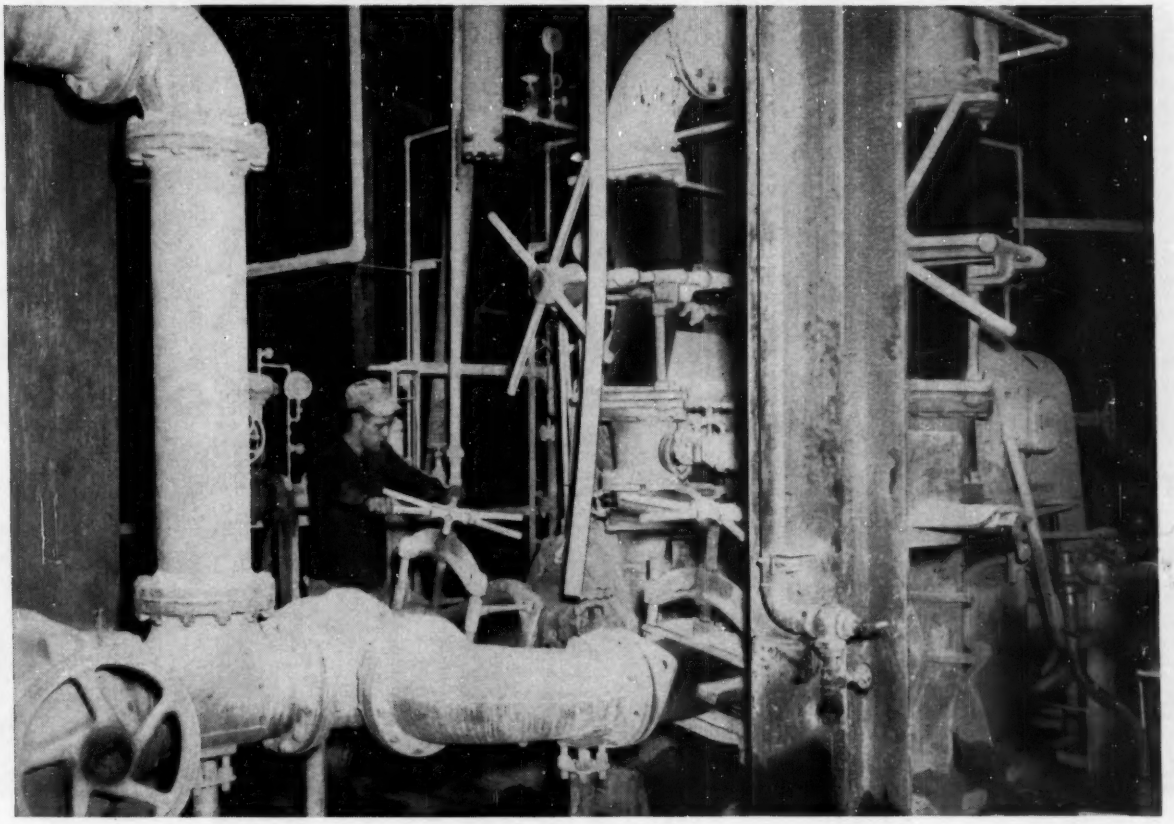
And we quote . . .

Financier Louis E. Wolfson, on why his Merritt-Chapman & Scott Corp. will halve its dividend rate: "Shareholder interest can best be served by plowing a greater portion of earnings back into the business." Wolfson further predicts expansion of the company's chemical and paint capacity, "where long-term growth possibilities and profit margins are most promising."

Health-Education-Welfare Secretary Marion Folsom, on future Salk vaccine supplies: "Manufacturers are hopeful that, within the next few months, production . . . will be increased . . . however, it is likely to be many months before enough vaccine will be available. . . . Accurate predictions of future supplies are impossible."

"U. S. Pilot Pinch Valves Last Twice As Long..."

says production official of phosphate chemical plant



"And these U. S. Pilot® Pinch Valves," he adds, "don't clog or freeze – they are made of rubber. They don't require the babying of metal valves– and they play a major part on our production." Although the life expectancy of these "U. S." valves is twice that of metal valves they cost less to install.

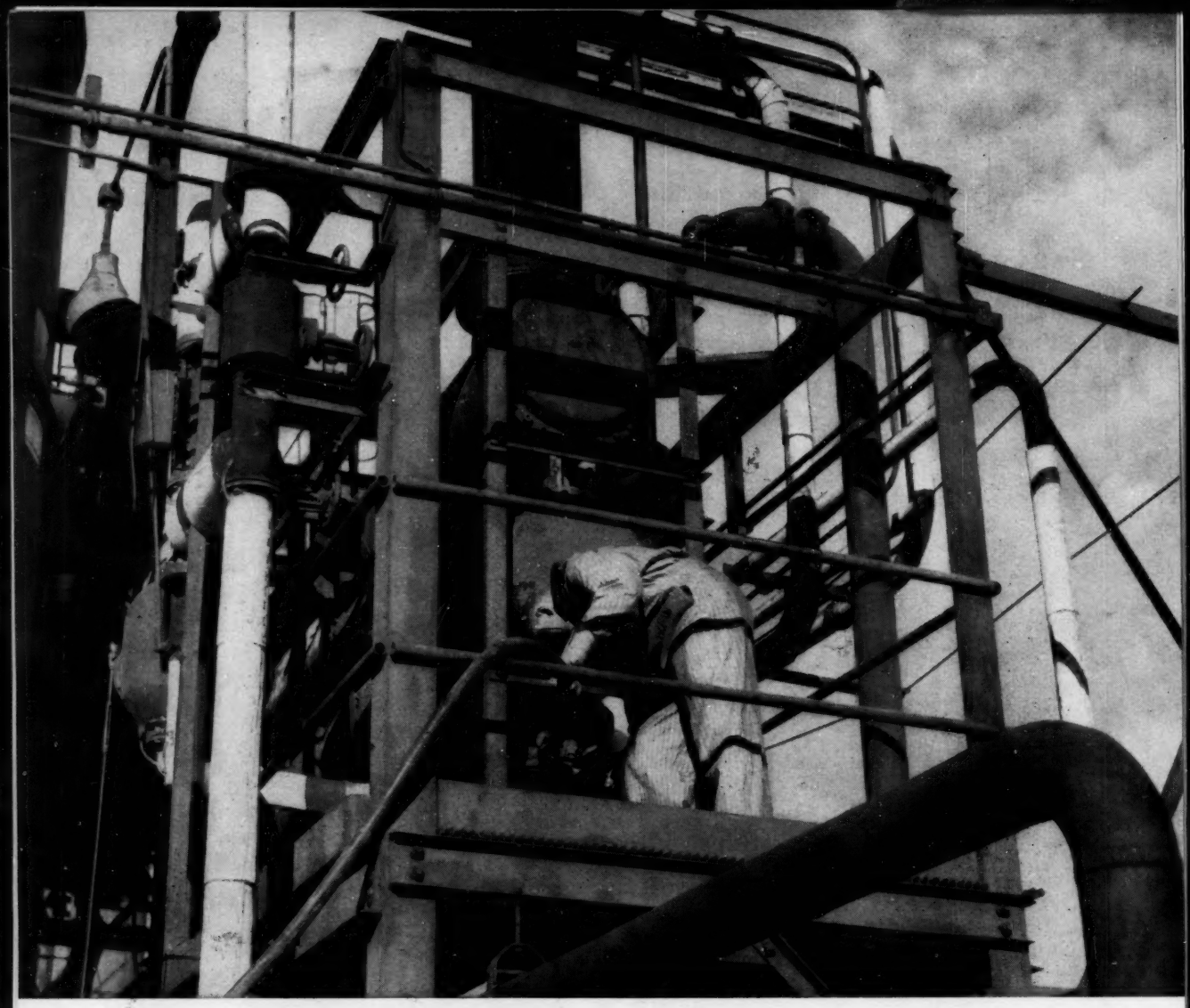
This phosphate plant, located in Florida, manufactures animal food supplements and fertilizer. It is in operation 24 hours a day, 7 days a week. In this rugged round-the-clock routine, "U. S." products have proved economical and highly satisfactory. To control, pipe and connect the highly corrosive and erosive semi-solids handled in the plant, U. S. Giant® Acid Hose, U. S. Expansion Joints and U. S. Pilot Flexible Pipe are used. The plant's officials have found that U. S. Rubber products are unmatched in facilitating production and in reducing maintenance and equipment charges. They have standardized on "U. S." products. It will pay you to take any and all corrosion problems to a "U.S." specialist.

Get in touch with any of our 27 District Sales Offices, or write United States Rubber Company, Mechanical Goods Division, Rockefeller Center, New York 20, N. Y.

US RUBBER

Mechanical Goods Division

United States Rubber



There's too much at stake —clean it right

Chemical cleaning involves costly equipment and often work stoppages. It's a job for experts. Let Dowell protect that equipment and keep production losses to a minimum when you have scale or sludge problems.

In over 15 years our trained engineers have serviced virtually every kind of equipment in plants, mills and refineries throughout industry. In fact, Dowell has cleaned over 10,000 boilers alone!

This experience means lower costs to you—in more thorough work, restored efficiency and less production loss.

Furthermore, Dowell engineers know you value the safety of your men and equipment. Dowell uses only the latest safety equipment and techniques to eliminate hazards and accidents. Our engineers work closely with your safety personnel to establish the safest possible working procedures.

Call the nearest of more than 165 Dowell offices. An experienced engineer will be glad to talk over and help you with your cleaning problems any time — at no obligation. Or write Dowell Incorporated, Tulsa 1, Oklahoma, Dept. C-92.

chemical cleaning service for industry

DOWELL

A SERVICE SUBSIDIARY OF THE DOW CHEMICAL COMPANY

Growing from Within

"We have built the skeleton. Now we're ready to put the flesh on it."

So reported John Hanes, chairman of Olin Mathieson's finance committee, to a *CW* editor last week. "As far as new interests are concerned, our company has essentially closed the diversification circle. Five years ago, we laid down a growth plan for ourselves. And we've stuck to it. Our next expansions won't come from acquisitions, but rather by growing from within."

Should any bright prospects outside that closed circle appeal to OM in the future, however, the already-diversified chemical major intends to bid for ownership in the open market—on cash or stock purchase terms, rather than by issuing new stock.

That new OM policy, in fact, has already been put to its first test. Just last month the firm acquired a 40% interest in F. H. McGraw Co. (the firm building OM's new aluminum plant)—but this time, rather than issue new stock, Olin Mathieson made the exchange for 16,400 already-issued OM shares, plus $298,000 (*CW, Jan. 28, p. 22*). It bought the shares itself on the open market.

Why Digest? One good reason for growing from within is that you don't dilute the percentage ownership that one share of stock represents. This is graphically illustrated by OM. At the end of 1949, Olin Industries and Mathieson Chemical had, roughly, a total of 3.5 million shares outstanding between them.

When they merged in '54, they had 11 million, and by the end of '55, 13 million. It's expected that by the end of 1960, this figure will increase to about 14.1 million—mainly through exercising of stock options and conversions of already-issued preferred.

How much Expansion? In view of its new credo of growth from within, how do Olin Mathieson's future prospects shape up? Hanes expects his firm's sales volume to grow from $560.5 million in 1955 to $655 million this year. Four years from now, by 1960, that figure is expected to hit around the $1.2-billion mark.

On this basis, Hanes looks for earnings/share to jump from $3.61 estimated this year to $7.88 in 1960, an increase of 118%.

To achieve such goals, Olin Mathieson will spend nearly $444 million in the next five years for new plants and equipment. Some $153.1 million of this is slated for the metals division (including the Clarington aluminum plant). Another portion, an estimated $111.4 million, will go for industrial chemical development.

Committed to such solid emphasis on metals and industrial chemical expansion, it's hardly likely that Olin Mathieson's present sales breakdown will long conform to this latest picture: drugs and pharmaceuticals, 17.2%; metals, 12.3%; explosives, 18.5%; paper and forest products, 12.8%; plant food and phosphate chemicals, 18.3%; industrial chemicals, 20.9%.

Butadiene Rebuff

The government won't give present and future butadiene producers assistance in the form of a rapid tax write-off.

The Interior Dept.'s Oil and Gas Division asked that such tax assistance be granted—a request that was at least tacitly supported by industry—but Defense Mobilizer Arthur Flemming turned down the request. Reason: Interior's own recently completed survey shows enough additional capacity on industry drawing boards to meet foreseeable defense needs without recourse to special government incentives.

Interior's Oil and Gas Division launched its study on the basis of a query from Flemming, who wondered about the adequacy of butylene supplies in event of war. In any emergency, alkylation plants will draw heavily on butylenes for military aircraft fuel. He wanted to know whether a wartime step-up in "avgas" output would leave enough butylenes available to make butadiene for GR-S synthetic rubber, also a vital material.

The answer, as shown by these Interior Dept. figures, appears to be "Yes." Plans now afoot will boost total butadiene capacity (excluding recycled butadiene) to 939,000 short tons/year before next January. Another 168,000 tons/year is "fairly firm" for early 1957. Together, these will add 279,000 tons to the 828,000-tons/year specification-grade butadiene capacity that Interior's survey showed existed on Jan. 1, 1956.

To reach a decision, Flemming's Office of Defense Mobilization specialists weighed these figures against two known facts:

- Synthetic rubber producers plan to boost GR-S capacity from the present 907,900 long tons/year (including oil-extended rubber) to 1,312,400 tons by late 1957. Both figures exclude the 122,000-ton plant at Institute, W. Va., which Goodrich-Gulf will put into partial operation this spring. The company has charted a four-year program of modernization for the plant—including installation of refrigeration equipment for the manufacture of cold rubber.
- Nearly all the planned expansion set by butadiene producers calls for using butane (from natural gas) rather than butylene (from crude petroleum) as the feedstock. Sole exception is Petroleum Chemicals, Inc., with a 15,000- to 20,000-tons/year expansion planned at its Lake Charles, La., butadiene plant. (PCI—Cities Service-Continental Oil—has ample refinery butylenes available locally to support this expansion.)

Taken all together, ODM believes these projections show that the synthetic rubber industry—and other butadiene consumers—will be no worse off for butadiene two years hence than they were in 1955 when GR-S output reached a new all-time high.

Company	Sales 1955 ($ millions)	Change from 1954	Net Profit 1955 ($ millions)	Change from 1954	1955 ratio, net profit to sales	1954 ratio, net profit to sales
Abbott Laboratories	$ 91.7	4.08%	$ 9.7	11.3%	10.6%	9.9%
Allied Chemical & Dye	628.5	18.4%	52.1	21.0%	8.3%	8.1%
American Agricultural Chem.[4]	47.9	—3.2%	4.2	—14.1%	8.9%	10.0%
American Cyanamid	451.1	13.5%	38.7 [1]	43.1%	8.6%	6.8%
American Potash[8]	27.7	17.4%	4.0	62.2%	14.4%	10.6%
Atlas Powder	60.3	4.7%	3.5	31.7%	5.8%	4.6%
Commercial Solvents	56.6	9.7%	3.5	29.4%	6.1%	5.2%
Diamond Alkali	110.3	18.0%	8.4	52.7%	7.6%	5.9%
Dow Chemical[5]	521.6	19.2%	49.3	48.1%	9.4%	7.5%
Du Pont[6]	1,909.2	13.2%	307.0	21.8%	16.1%	15.0%
Foote Minerals	15.3	16.8%	0.9	—26.8%	6.0%	8.0%
Freeport Sulphur	63.3	10.4%	12.4	22.8%	19.5%	18.6%
Gen. Aniline & Film	121.2	15.4%	4.2	67.4%	3.4%	2.4%
Hercules Powder	226.7	20.9%	19.0	34.8%	8.4%	7.5%
Heyden	24.7	41.9%	1.5	114.4%	6.1%	4.0%
Hooker[5]	94.2	21.5%	10.6	28.7%	11.2%	10.6%
Interchemical	100.5	11.9%	4.8	25.9%	4.7%	4.1%
Int. Min & Chem.[4]	94.8	—0.3%	4.8	—19.3%	5.0%	6.2%
Koppers	230.3 [3]	22.3%	10.4	70.0%	4.5%	3.3%
Merck	157.9	8.5%	15.7	24.6%	9.9%	8.7%
Monsanto	522.3	18.6%	42.2	21.3%	8.1%	7.9%
Olin Mathieson	560.5	11.5%	44.6	17.1%	8.0%	7.6%
Pennsalt	67.8	19.6%	3.5	0.0%	5.1%	5.8%
Pfizer	163.8	12.8%	15.3	0.8%	9.4%	10.4%
Pittsburgh Coke & Chem.	56.6	58.7%	3.1	185.3%	5.5%	3.0%
Rohm & Haas	161.6	21.9%	17.7	42.2%	10.9%	9.4%
Spencer[4]	39.4	16.5%	5.2	9.3%	13.1%	14.0%
Stauffer	145.5	24.4%	12.3	33.7%	8.6%	7.9%
Texas Gulf Sulphur	94.8	9.7%	32.4	6.0%	34.1%	35.3%
Union Carbide	1,187.2	28.5%	140.8	56.8%	11.9%	9.7%
Victor	48.4	11.6%	4.0	8.1%	8.2%	8.5%

(1) before preferred dividend.
(2) excluding Lion Oil dividend.
(3) includes revenue from other sources as well as sales.
(4) calendar year.
(5) 12 months to November 30.
(6) excluding General Motors dividends.
(7) government-owned, does not pay dividends.
(8) preliminary.

For Chemicals—a Record Record

For an industry that grows at an average rate of roughly 9% a year, new records in sales and profits are pretty regular things. Even in years of general economic recessions, chemicals usually suffer less than other industries. So it's not surprising that 1955 was a record record year. CHEMICAL WEEK's tabulation of annual earnings (*above*) tells the story.

Only three shadows appeared on the '55 profit escutcheon—American Agricultural Chemical and International Minerals & Chemical, which both had sales and earnings reduced by a long and costly strike in their Florida phosphate operations; and Foote Mineral, which committed a substantial amount of the year's revenue to its expansion program.

And there's no question today that these companies' operations are on a par with others in the industry.

Current Report: Generally, there's optimism about 1956 earnings. There are even a few financial men who think Eisenhower's decision to be available for four more years as President (*CW, March 3, p. 13*) may touch off a giddy speculative boom.

Will this happen? Probably not. Of course there's a chance, but there's little likelihood that Washington would let loose a runaway inflation.

More important is the question of profit margins. While two-thirds of the 31 companies in *CW*'s sample showed an increase in their ratio of net profit to sales for '55, there's some doubt that such margins can be held in '56.

Look first to the freight increases. The 6% rise allowed railroads on most chemical commodities may well squeeze some profits. Then note wage-bargaining negotiations that are com-

1955 ratio, common stock div. to earnings/share	1954 ratio, common stock div. to earnings/share
72.1%	83.7%
55.0%	65.8%
66.7%	63.3%
61.4%	67.8%
39.3%	45.7%
48.9%	49.4%
76.4%	99.8%
44.4%	70.1%
47.0%	70.4%
75.5%	75.0%
43.4%	8.7%
52.9%	59.5%
—— [7]	—— [7]
47.8%	58.8%
50.0%	250.0%
55.8%	58.9%
42.6%	43.7%
85.1%	68.1%
50.8%	90.3%
57.1%	73.4%
46.3% [2]	56.9%
57.0%	64.3%
66.0%	76.1%
52.7%	45.8%
53.2%	140.8%
11.6%	13.3%
59.4%	62.7%
36.5%	43.0%
61.9%	60.0%
62.0%	80.6%
67.1%	64.4%

ing up. The chemical industry may well find that the 6% wage increase granted by most oil firms (and many petrochemical makers) is a floor, not a roof, for their wage bargaining.

Countervailing Factors: But look, too, at manufacturers' plans for expansion and modernization.

Capital spending hit a peak in the third quarter of '53—a $29-billion /year rate for all industry. Then it slid to a $26-billion rate by early '55. But now it has recovered, shooting up to a record high of about $31 billion /year.

And so, optimism abounds. If '56 isn't better than '55, it should at least be the second-highest record.

Petrochemical Promise

Wherever you find untapped natural gas reserves, you're almost bound to uncover companies keen on developing those resources to attract chemical users.

Just such prospects now seem in sight for western Wyoming's Green River Basin—an area said to contain one of the greatest natural gas caches in the continental U.S.

Rocky Mountain Corp. — which now owns or options more oil and gas leases in the basin than any other firm—and Technical Industries Corp. (Rocky Mountain's industrial development subsidiary) are beginning to take initial steps to upgrade the area industrially, hope to lure chemical newcomers.

Both firms are evaluating the pros and cons of $500 million worth of industrial projects to launch the basin as a desirable plant site. Projects scheduled for immediate study:

- A natural gas transmission line from Pinedale, Wyo., east to Minneapolis, St. Paul, Milwaukee and Chicago, over more northerly routes than others contemplated so far.
- A $200-million electric generating plant powered by natural gas. Proposed capacity: about 1 million kw.
- Chemical plants for manufacturing such materials as butadiene, rubber, anhydrous ammonia, carbon black, glycols and alcohols, petroleum detergents, plastics.

If detailed studies prove these projects feasible, Rocky Mountain aims to build them itself, financing through public sale of stock. Such public sale, however, will have to come with Securities Exchange Commission approval and suitable stock underwriting since Rocky Mountain and Technical Industries are both closed corporations (incorporated three years ago in Wyoming), entirely held by one family.

Nevertheless, eager to drum up interest in the proposed area development, Rocky Mountain's chief, Robert New, says, "Aside from being offered rich raw material and natural gas supplies, industrial newcomers to the region will benefit in other ways, too."

He's referring to Wyoming's liberal tax structure. Tax savings alone on the proposed $200-million power installation would probably justify earnest consideration of Wyoming as a site.

Some other chemical firms now operating in Wyoming: Intermountain Chemical (at Westvaco), Jefferson Lake Sulphur (Manderson), Texas Gulf Sulphur (Worland), and Wyoming Gulf Sulphur (Cody).

Further in Atomics

A firm that has made diversification of its atomic energy activities a key word in its development has taken a new step.

Vitro Corp. of America has bought into a thorium-rare earths processing operation, has also taken a step into titanium chemistry.

Vitro's move was to buy half of Crane Corp.'s (Chicago) interest in Heavy Minerals Co. and its mining subsidiary Marine Minerals.

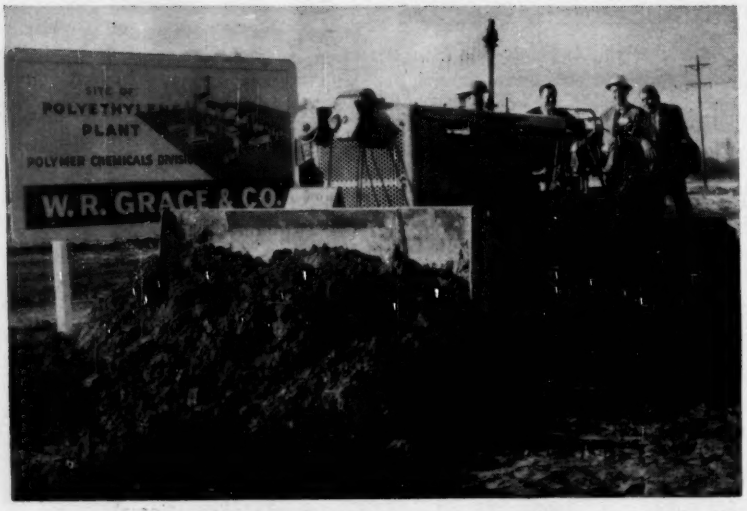
Marine Minerals supplies, among other materials, the ilmenite and rutile materials used in titanium metal and pigment production. Crane recently sold a half interest in its subsidiary Cramet, Inc., a titanium producer, to Republic Steel. (*CW, Feb. 4, p. 13*).

Until now, Crane owned an 80% interest in Heavy Minerals. (The remaining share is held by the Pechiney subsidiary, Societe de Produits Chimiques des Terres Rares.) By the end of the year, Crane and Vitro's combined investment in Heavy Minerals will total about $6 million.

Heavy Minerals, using a site near Chattanooga, will process monazite into rare earths and thorium, and zircon for others' zirconium and hafnium production. Marine Minerals mines rutile, ilmenite, zircon and monazite near Aiken, S.C., and will mine similar materials near Panama City, Fla.

Always Building . . .: This project joins a handful of other chemical and atomic ventures that Vitro now plans. Among them:

- Testing a new uranium purification process at its Salt Lake City processing mill. It feels that the process, which uses solvents other than the customary sulfuric acid, may eventually replace sulfuric leaching as the most economic recovery process.
- Considering building a plant to reprocess spent nuclear reactor fuel slugs—thus making use of its current fission product separation interests. Because of the investment involved ($10-20 million), Vitro might consider it as a joint project with a major chemical firm.



LONG, MILLER, KENNON: At Baton Rouge, senator, division head, governor.

More Familiarity

In the Baton Rouge, La., area the always-familiar sights and sounds of chemical plant building (CW, Oct. 3, '53, p. 19) are even more noticeable these days.

Last week, for example, W. R. Grace broke ground for its $18-million polyethylene plant north of the city.

But judging from the recent round of chemical expansion decisions, plus the optioning of land in the area, Grace won't claim the honor of having the newest plant for long.

In a year, the Baton Rouge chemical landscape will be substantially altered, pretty much according to this timetable:

- Grace by midsummer will have its semiworks polyethylene unit operating. By June '57, its larger polyethylene plant is expected to be on-stream. Both units front on the proposed Baton Rouge Barge Canal and will take ethylene from Esso Standard Oil.
- Esso itself will begin in May to build a $12-million ethylene plant (*CW Business Newsletter, Jan. 28*) at its present refinery site. This addition should be complete by May of next year.
- Kaiser Aluminum and Chemical will break ground next month for an $8-million chlorine-caustic plant adjacent to the firm's alumina project now abuilding at Gramercy, south of Baton Rouge.
- Naugatuck Chemical by July '57 will have more than doubled its present capacity for producing butadiene-styrene-acrylonitrile copolymers by adding a new plant on the proposed barge canal. That 150-acre site is 2 miles from Naugatuck's plant now turning out the same products. Esso Standard's refinery will continue to supply petrochemical raw materials.

In addition, by exercising land options they now hold, three other chemical majors could further shape the already-lively Baton Rouge chemical scene:

- Du Pont could exercise its option on 2,500 acres 11 miles north of the city along the Mississippi River. At the moment, however, Du Pont reports no firm plans for developing this property.
- Dow Chemical could select one, and possibly two, of a trio of river-front sites along the west bank south of Baton Rouge for future building. First proposals: $20 million worth of chlorine-caustic and organic chemicals production facilities.
- Wyandotte, at its directors' meeting next month, could o.k. proposed plans to expand ethylene oxide, ethylene glycol, and chlorine-caustic capacity at its 700-acre optioned site (downriver from Baton Rouge).

Three W's: As matters stand now, these actual and potential expansions trace the "what" and "where" of the formidable '56-57 chemical parade in Baton Rouge. But "why"?

Take the Grace and Kaiser plans:

Admittedly, Grace's decision to locate its polyethylene plant there was weighted heavily by the proximity of Esso's big refinery (3 miles away) from which it will get its ethylene.

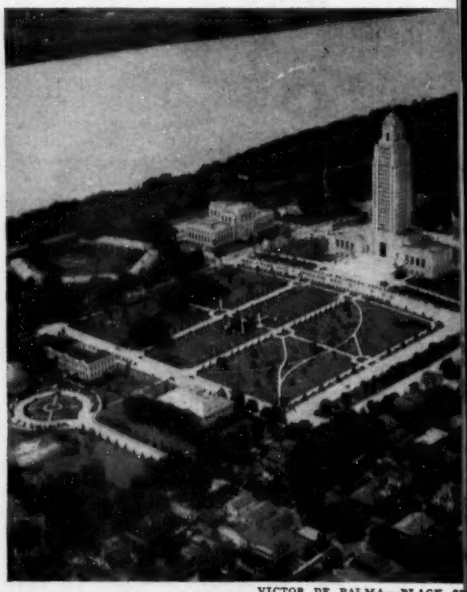
But the second deciding factor, Grace says, aside from the more usual economic ones that help determine new plant locations, was that the prevailing industrial climate in Louisiana is excellent.

Says one Grace spokesman: "We were impressed by the fact that Louisiana has one of the best State Industrial Commissions in existence today. What's more, business and state circles proved to us that they wanted Grace in Baton Rouge."

Kaiser's decision to build a second alumina plant and related chlorine-caustic unit at Gramercy was somewhat more complex.

Gramercy is but a short ocean haul from Kaiser's Jamaican bauxite mines. What's more, the site is linked by water to Kaiser's reduction mill at Ravenswood, W. Va., which, in turn, can barge to fabricators in the Midwest and East.

Furthermore, the Gramercy site offers twin merits of ready access to natural gas (for fuel) and raw-material salt deposits. So for Kaiser, the Gram-



VICTOR DE PALMA—BLACK S

BATON ROUGE AND RIVER: Luring more chemical industry.

Washington Angles »»

»» **The Great Lakes will see bigger boats** in the years ahead. That's the likely result of a bill that has just received its clearance from Congress.

It authorizes deepening the connecting channels between the lakes to 27 ft.—thus admitting oceangoing ships.

»» **The merger notice bill, too,** is moving through Congress. The full House Judiciary Committee has okayed the measure, which requires large companies to give the government advance notice of mergers. Early House action is expected.

»» **Don't look for fast action** on a bill to allow the Bureau of Standards to use fees collected for calibration and other testing services to pay its own costs for the service. Currently, the bureau must turn all receipts in to the Treasury, depending only on money formallly allocated by Congress for wages, overhead, and the like.

There's some pressure for the move. Scientific Apparatus Manufacturers Assn. has asked members to request action—but the House Commerce Committee hasn't yet received any such pleas. Hence, no one's anxious to act. Only action by committee and the full House is needed for passage.

»» **An incentive for greater aminotriazole use** was revealed last week by Agriculture Dept. scientists. They found that tripling the normal 1-lb./acre dose used in defoliating cotton plants halves the needed amount of such other defoliants as sodium chlorate, sodium metaborate and magnesium chlorate.

And it does a better job.

»» **A new "Little Cabinet" member** is a former Du Pont official. Defense Secretary Wilson has named Roger W. Fulling to be Acting Assistant Defense Secretary for Properties and Installations. Fulling was with Du Pont until he took a government job in Jan. '55.

---

ercy site makes strategic economic sense.

In perspective, both Grace and Kaiser express what the other comers to Baton Rouge recognize as unique assets:

- Availability of petrochemical raw materials.
- Rich deposits of salt for chlorine-caustic production.
- Unlimited water supply from the Mississippi, plus extensive dock and port facilities for both oceangoing ships and barges.
- A rapidly growing chemical market.
- A healthy and sympathetic climate for chemical industry.

Peruvian Push

Fertilizantes Sinteticos, Peruvian fertilizer producer, plans to build a $7-million petrochemical plant. Montecatini will provide technical assistance and processes, while European financial interests will provide the financing. (The Peruvian firm's present capitalization is $4 million.)

Initial capacity of the new plant will be 18,000 metric tons/year of anhydrous ammonia. Other products—nitric acid, ammonium nitrate and calcium ammonium nitrate—will be derived from the ammonia. Perhaps 50,000 tons/year of calcium ammonium nitrate could be produced.

Present plans schedule the startup of operations by late 1957. Meanwhile, Peruvian technicians and operators will be trained by Montecatini in Italy.

Fertiliza was formed in 1947 to study the possibilities of a petrochemical plant in Peru.

COMPANIES. . . .

Textron American on March 31 will acquire all outstanding stock of General Cement Manufacturing Co. (Rockford, Ill.).

•

Imperial Paper and Color (Glens Falls, N.Y.) will form a subsidiary Canadian corporation to produce chemical pigment colors. A plant has been purchased in St. Johns, Que.

•

C. D. Searle (Skokie, Ill.) has acquired 130 acres outside of Wheeling, Ill., for expansion of production and research facilities.

•

American Cyanamid has called for redemption May 4 of approximately 25,000 shares of its series B cumulative preferred stock.

•

The proposed merger between Gulf Oil and Warren Petroleum will go through. Some 83% of Warren shareholders have submitted their shares for exchange of stock, so Gulf took up its option to exchange. Shareholders receive four shares of Gulf for every five of Warren, except for a previously arranged exchange whereby some 298,684 shares are to be exchanged on an 18-of-Gulf-for-25-of-Warren basis. Gulf plans to operate Warren as a separate corporation with no change in its management.

•

Illinois Zinc and Hayden Projects have reached a tentative basis for a proposed amalgamation. Hayden holds licenses for hydrometallurgical treatment of copper ores and concentrates. Illinois Zinc owns lead and zinc mines in the vicinity of Silver City, N.M.

EXPANSION. . . .

Exolon Co. (Buffalo) is undertaking a three-year $500,000 expansion program at its Tonawanda, N.Y., and Thorold, Ont., plants. Expansion funds will go mainly to the Thorold silicon carbide and aluminum oxide units.

•

Methyl Acetate: Borden will undertake a 50% capacity boost in technical-grade methyl acetate production

at Leominster, Mass. New output: 1 million gal./year.

•

Nitrogen Products: North American Cyanamid (Welland, Ont.) will double its agricultural nitrogen solutions producing capacity. In addition, anhydrous ammonia facilities will be enlarged.

•

Kraft Paper: If it gets directors' approval, Western Kraft will hike its Albany, Ore., mill capacity from 120 tons to 200 tons/day. Cost of the added facilities: about $5 million.

•

Cement: The French Lafarge cement group will build a major cement plant at Lulu Island, near Vancouver, B.C.

•

Fertilizer: Mississippi Chemical will build a high-analysis fertilizer plant at Pascagoula to produce 125,000 tons/year. Cost: $5 million.

•

Refractories: General Refractories of Canada, Ltd., this spring will build at Smithville, Ont., a plant for chemical refractory brick and related materials.

FOREIGN. . . . . .

Paints/Venezuela: Du Pont de Venezuela will build a new paint plant near Caracas. Scheduled for completion this year, the new unit will produce lacquers, enamels, paints, varnishes, resins and thinners for Venezuelan markets.

•

Resins/Italy: Asfalti Bitumi Combustibili e Derivati (A.B.C.D.) will build a new $10-million plant in Ragusa to obtain by-products needed for the manufacture of synthetic resins from residual oil.

•

Polystyrene/Japan: Asahi Dow will soon begin production of polystyrene resin from semifinished styrene to be imported from America.

•

Plastics/Spain: Monsanto has just acquired an equity interest in Etino-Quimica in exchange for machinery, equipment and technical aid. Monsanto Overseas will expand the Spanish firm's polyvinyl chloride facilities, build a new polystyrene unit. The equity interest is "less than 50%," according to a Monsanto spokesman.

Lowering the Barrier

East-West trade is getting another look-see from Congressional probers. Aim: to show that the recent increase in number of items that can be traded gives the Reds a cold-war advantage.

But even a further relaxation of restrictions is coming. Look for more trade, not only between the free world and Russia, but also with its European satellites and Red China.

HOW MUCH trade should there be between the Communists and the West?

Ask the question 100 times, and you'll get 100 different answers, for the whole question is bound up with patriotism, tariff protectionism and the pocketbook.

This week, a Senate committee reached the climax in a broad investigation of the question—but whether they came up with any worthwhile conclusion is still being debated.

The probers heard such top-level Administration luminaries as Commerce Secretary Sinclair Weeks, disarmament chief Harold Stassen and Undersecretary of State Herbert Hoover, Jr., explain that current trade regulations are in good balance—allowing free-world nations to keep up their levels of world trade, yet withholding from Russia the goods that might build up her war potential. But the probers—members of the Senate Permanent Investigations subcommittee—were unconvinced. The senators, headed by Arkansas Democrat John L. McClellan, still feel that the relaxation of trade curbs in 1954 has allowed Britain and other allies of the U.S. to send large enough quantities of such commodities as copper, aluminum, asbestos, talc and various organic chemicals to help the Soviet gird for war.

The probe comes at a time when pressure is building up for a relaxation of curbs against Red China trade, and it could easily tend to increase resistance to such a move in Congress. Nevertheless, the Administration will join its European allies in reviewing international controls on trade with China, bringing them more into line with restrictions (*see chart*) on trade with Russia and its satellites.

Due to the Diplomats: This decision—a difficult one in the face of Congressional hostility—is based on a number of diplomatic considerations. The move will improve strained relations with Malaya, Ceylon, Japan and Indonesia—and perhaps keep them from moving deeper into the Communist sphere.

Beyond that, U.S. policy has always been based on the assumption that the only way to get any effective trade control is through voluntary international cooperation. Britain and other nations have threatened to go ahead and loosen up trade with China, with or without the U.S.; our officials believe that a better control system can be maintained with U.S. participation than without it.

Actual trade between the U.S. and Red China will not be affected, however. There's no thought of lifting the total embargo on American exports to that country.

Push by the Probers: Nonetheless, Congressional probers hope to influence Administration policy by collecting evidence that war-essential materials have been shipped to Russia and satellites.

It's likely, too, that chemical witnesses will be called to point out the essentiality of such shippable materials as phosphorus, polyisobutylene, methyl methacrylate, lithium and its compounds, sodium chlorate, perchlorates and persulfates, and aniline.

There's no thought in the probers' minds that the record on any single commodity would be enough to change U.S. policy as concerns any future lowering of bars to China trade. Neither is there a hope for any tightening of current controls on trade with European Communist countries. Instead, they hope to come up with a sum of facts to amply prove that trade has helped tip the war-potential balance in favor of Russia.

But many Washington observers see a concurrent reason: top Democrats are still rankled about charges made by Vice-President Nixon and others during the 1954 Congressional cam-

YOU CAN NOW SHIP THESE CHEMICALS TO RUSSIA AND HER SATELLITES

Acetic acid (80%+)
Acetic anhydride
Acetone
Aluminum chloride, anhy.
p-Aminophenol and deriv.
Ammonium nitrate
Aniline
Antimony and cpds.
Asbestos
Benzene
Bismuth cpds.
Boron carbide
Cadmium and cpds.
Calcium and cpds.
Carbon blacks
Catalysts, nickel deposited on other materials
Cellulose nitrate, not above 12.3% N
Chlorfluoromethanes
Chrome oxide (green)
Chromic acid
Dichlorostyrene
n,n-Dimethyl aniline
Dynamite
Ethyl cellulose
Ethylene dibromide
Formaldehyde
Glycerol
Hydroquinone
Isopropyl alcohol
Lithium and cpds.
Methanol
Methyl isobutyl ketone
Methyl methacrylate
Mica
Monochlorobenzene
Mononitrobenzene
Naphtha solvents
Nitric acid
p-Phenylene diamine
Phosphoric acid catalyst
Phosphorus
Phthalic anyhdride and esters other than alkyds
Polyisobutylene
Polypropylene glycol
Potassium chlorate
Potassium dichromate
Potassium nitrate
Potassium perchlorate
Potassium persulfate
Potassium permanganate
Potassium tetroxide
Pyrites
Rubber accelerators and antioxidants
Sodium chlorate
Sodium cyanide (95%+)
Sodium dichromate
Sodium metal
Sodium nitrate
Sodium perchlorate
Sodium persulfate
Strontium cpds.
Styrene
Sulfuric acid, including oleum
Talc
Tars, unrefined coal
Thallium bromiodide
Tin and cpds.
Tricresyl phosphate
Tungsten cpds.
Vanadium cpds.
Zinc and cpds.

BUT . . . YOU STILL CAN'T SHIP THESE

Barium nitrate
Basic slag
Beryllium cpds.
Butane (and mixtures containing it)
Cadmium lithopone
Calcium cyanamide
Cellulose nitrate, more than 12.3% N
Chromium cpds. and preps., other than lead-chromium and zinc-chromium pigments
Cobalt cpds. other than naphthenates and linoleates and organic pigments containing less than 20% Co.
p,p'-Diaminodiphenyl methane
1,2-Dibromoethane
Diethyl diphenyl urea
Dimethyl diphenyl urea
Dinitro phenol
Dinitro toluene
Diorthotolyl urethane
Diphenylamine
Unsym. n,n-dimethyl urea
Diphenyl urethane
Ethyl benzene
Ethyl-unsym.-n,n-diphenyl urea
Ethyl phenyl urethane
Fluorine
Furfural
Furfuryl alcohol
Glycols, their esters and ethers and ether esters
Gold cpds.
Guanidine nitrate
Hexamethylene tetramine
Hydrazine and salts
Hydrogen peroxide (over 50%)
Indium cpds.
Lead azide
Lead styphnate
Lead tetraethyl
Lead thiocyanate
Magnesium oxide (97%+)
Methyl-unsym.-n,n-diphenyl urea
Molybdenum cpds. (35% + Mo or pigments that are 50%+)
Naphthenic acid
Nickel hydroxides
Nickel oxides
Pentaerythritol
Phenol and mixtures, primarily phenol
Phenoxyethyl dimethyl dodecyl ammonium bromide
Phenyl-α-naphthylamine
Phenyl-β-naphthylamine
Picric acid and salts
Radioactives, including ferrouranium, mesothorium cpds., radium and cpds., thorium and cpds., uranium and cpds.
Selenium and cpds.
Sodium azide
Tantalum cpds.
Tetrahydrofurfuryl alcohol
Titanium tetrachloride
Toluene
o-Tolyl-β-naphthylamine
Trifluorchlorethylene
Zirconium and cpds.

Source: Senate Permanent Investigations subcommittee. Data are collated from British export lists and unclassified U.S. material.

paign that Democrats are soft on communism. Hence, reason these observers, the leadership is anxious to exploit any inconsistency in the Administration's relations with Russia. And it seems right now as though they have uncovered some inconsistencies in the trade agreements.

It's uncertain, however, how much more of a case can be proved. Decision on whether or not to allow trade in a specific item can seldom be black and white. Too, a correct decision, in the light of an international conference, may be rather difficult to justify before a Congressional committee.

Additionally, Administration people point to the safeguard in current rules whereby every U.S.-Communist trade transaction must get specific export license approval. With this, they say, while a 10-lb. shipment of sodium chlorate might be okayed for export, a ton lot might well be held up.

There's a substantial gray area on the subject of East-West trade, which makes it difficult to draw hard-and-fast rules. But one thing's sure—barring a sharp upturn in the cold war, there will be a substantial increase in pressure for more trade.

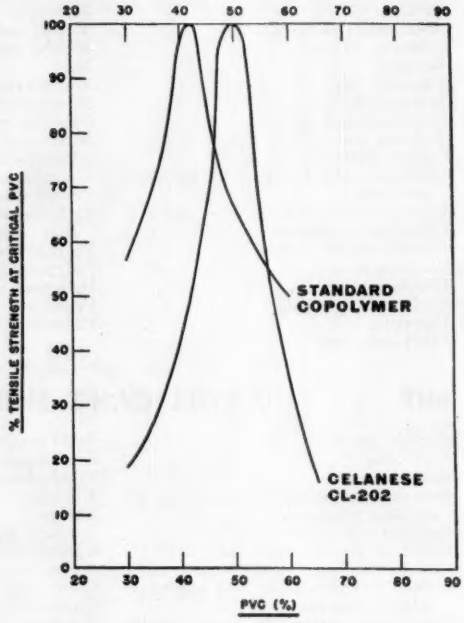
This comes from countries that see trade with Russia as the only way to increase their exports, or—in some cases—to keep their current export volumes. And with the present flexibility being shown by the Kremlin in foreign policy, trade that gives the Russians a new entry to a country's commerce will very much be a part of their diplomatic bag of tricks.

"Don't pigeonhole

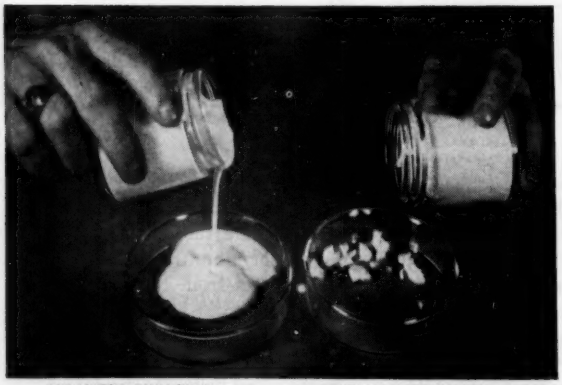
PRIMER SEALER WITH CELANESE EMULSION

PRIMER SEALER WITH STANDARD EMULSION

LOW TEMPERATURE COALESCENCE. Pictured above are two primer sealers identical in formulation except for the emulsions used (both homopolymers). These primers were cast (4 mil wet film) at *34° F. on glass* and allowed to *cure overnight at this temperature*. The paints were then stained and photographed from the reverse side of the glass. The primer on the left made with Celanese PVAc exhibited superior film coalescence as evidenced by the sharp reduction in stain penetration.

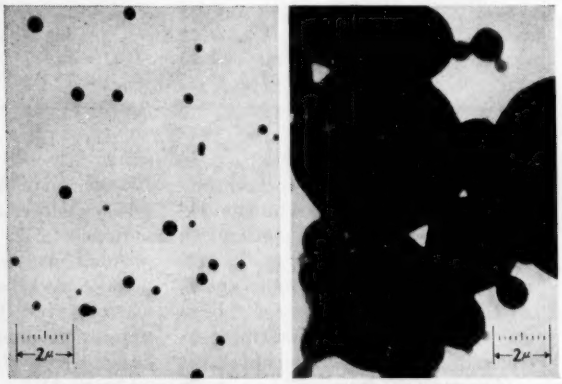


HIGH PIGMENT BINDING. Celanese emulsions are designed as paint vehicles. Because of this they exhibit extremely high pigment binding capacity. The above graph was prepared by plotting the tensile strength of paint films at progressively higher PVC's. A standard formulation was used and only the emulsions differed. In this comparison (both copolymers) the Celanese emulsion exhibited a critical PVC of 8% above the other copolymer.



CELANESE EMULSION STANDARD EMULSION

SUPERIOR FREEZE-THAW STABILITY. The two emulsions pictured above have been subjected to a standard freeze-thaw stability test (1 cycle = —14° C. for 16 hours, then thaw at room temperature). The Celanese PVAc emulsion at the left successfully passed a repeated freeze-thaw cycle while the one at right coagulated after 1 freeze-thaw cycle.



CELANESE EMULSION STANDARD EMULSION

FINE PARTICLE SIZE. The "inside story" of Celanese improved PVAc emulsions is clearly demonstrated in the above photomicrographs. Fine particle size indicates higher pigment binding, better non-settling, tighter, more closely knit films and better penetration of chalky or porous surfaces when applied at low viscosities.

your plans for PVAc Paint!"

Celanese has a brand new answer

Has your experience with early PVAc emulsions caused you to shelve your vinyl latex paint program?

If so, consider this . . . with new Celanese PVAc emulsions, you can formulate paints with quality unsurpassed by any latex paint, regardless of the *type* or *price* of emulsion used. These are broad claims! . . .

And we can back up these claims because Celanese PVAc emulsions are specifically designed as paint vehicles and represent the latest advances in PVAc emulsion technology . . . advances like these:

Can be formulated at PVC's approaching those of alkyd flats.

Extremely fine particle size.

Superior low-temperature film coalescence—even below 40°F.

Tough, flexible, weather-resistant films.

Superior freeze-thaw stability.

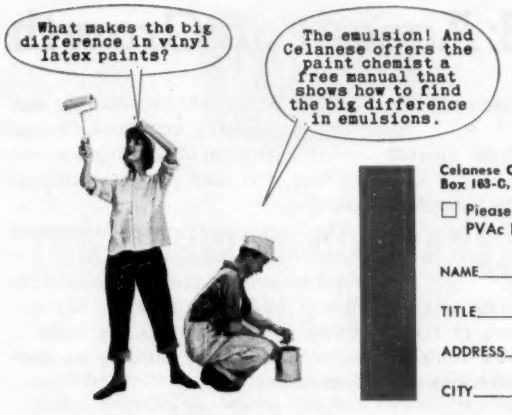
High solids content: 55% ± 1.

Superior pigment wetting ability—extra margin of safety against flocculation difficulties.

Crystal-clear, water-resistant films.

Excellent mechanical stability; can even be milled.

A Celanese technical representative will be happy to discuss these characteristics with you and assist you with any technical problems you have. In addition, Celanese has prepared a manual of standard laboratory tests by which you can determine the properties of any resin emulsion vehicle. You can obtain a copy of this manual along with technical bulletins covering Celanese PVAc paint emulsions by filling out and mailing the coupon below.


What makes the big difference in vinyl latex paints?
The emulsion! And Celanese offers the paint chemist a free manual that shows how to find the big difference in emulsions.

Celanese®
plastics and resins
*Reg. U.S. Pat. Off.

Celanese Corporation of America, Plastics Division,
Box 163-C, 290 Ferry Street, Newark 5, New Jersey

☐ Please send me brochure on Celanese PVAc Emulsions, including test manual.

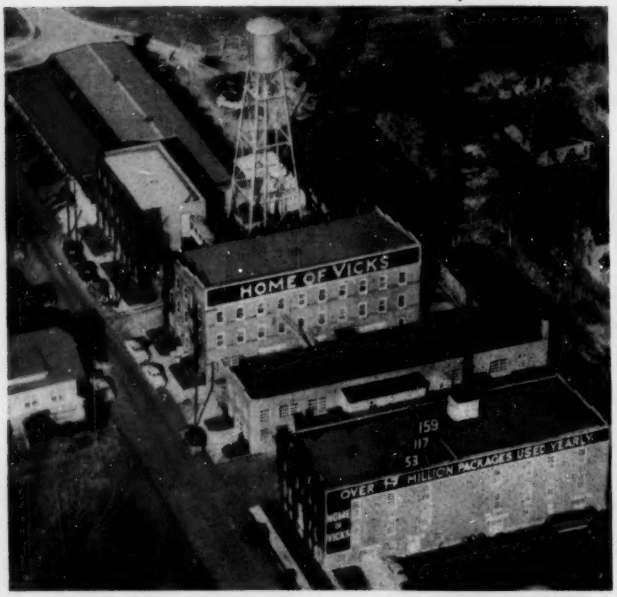
☐ Please send me samples of Celanese PVAc Homopolymer and Copolymer Emulsions for paints.

NAME_____

TITLE_____ COMPANY_____

ADDRESS_____

CITY_____ ZONE_____ STATE_____



GREENSBORO, N. C., HOME: In 1890, a drugstore and medications for common cold.

PHILIPPINES: In 1956, $78 million sales in 119 countries, nine manufacturing groups.

GUY-GILLETTE

MORE MINDPOWER: Tough field-training from the start, emphasis on the weak spots.

PRESIDENT MABRY: 'We'll build more plants, go from export to international.'

From the Common Cold: Accent on Growth

"Acquisition isn't the only way of growing," says Vick Chemical's President E. L. Mabry in detailing his company's three-pronged development offensive. Now that acquisition of the National Drug Co. (CW, March 3, p. 14) is virtually complete, Vick is diversifying its efforts, as well as its products, in promoting decentralization.

Although there'll be no slackening of the search for profitable additions, Mabry continues, Vick's campaign has other facets:

- Increased emphasis on internal expansion.
- Continued executive development.
- Steady searching for new products and processes.

Outlook is one of "continuity in growth," and it dates back to H. S. Richardson, son of Vick's founder, who recognized that Vaporub may one day die. In 1933, he proposed the concept of acquiring new products, and with it a program of readying new men to take over and promote company growth.

Today Vick is largely the result of Richardson's approach. Owner of eight subsidiaries operating in carefully chosen fields (*see table, p. 32*) and selling in 119 countries, it's ready to concentrate further building on these foundations.

"From a corrosion, abrasion and mechanical standpoint,

DURCOPUMPS

are best for the job."

Shown is a part of the Durco equipment in service at Filtrol Corporation's Vernon Chemical Plant. These pumps (and Durco Type K Valves) are handling ammonium aluminum sulfate (alum) slurries and clear liquors with small percentages of sulfuric acid. Temperatures are 150° F. to 220° F.

The Vernon Chemical Plant manufactures high purity alumina and ammonium sulfate.

Filtrol, along with other leading companies throughout the world, uses DURCO chemical service equipment for maximum service life and minimum maintenance when handling severe corrosives.

DURCO
CORROSION RESISTING ALLOYS & EQUIPMENT

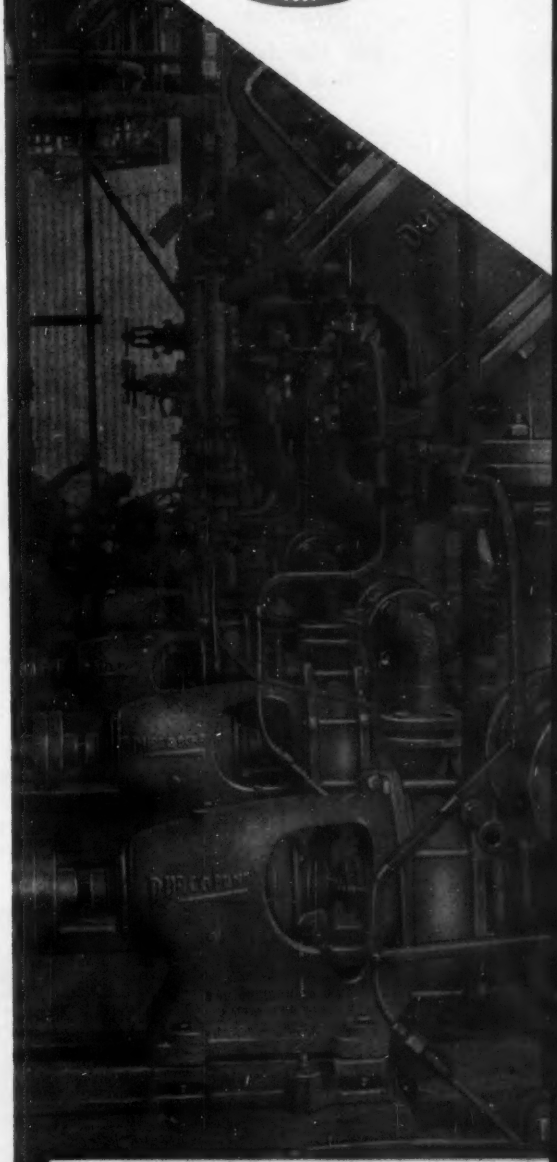
THE DURIRON COMPANY, Inc.
Dayton, Ohio

BRANCH OFFICES in Atlanta, Boston, Buffalo, Chicago, Cleveland, Detroit, Houston, Knoxville, Los Angeles, New York, Philadelphia and Pittsburgh.

A **DURCO** installation at
FILTROL Corporation

Vernon Chemical Plant
Vernon, California

FILTROL PRODUCTS



Series R Durcopumps are immediately available from stock at Dayton. Write for details.

THE VICK ROSTER

Here's How Vick Is Diversified

Divisions

Vick Products (New York)	Merchandises home medication specialties and mass market cosmetics
Vick International (New York)	Merchandises medication specialties for foreign consumption
Vick Manufacturing (New York)	Manufacturers for Vick Divisions, McKelvey and Prince Matchabelli

Acquired Companies

Name	Founded	Acquired	Products
Wm. S. Merrell Co. (Cincinnati)	1828	1938	Ethical pharmaceutical specialties
National Drug Co. (Philadelphia)	1906	1956	Ethical pharmaceutical specialties
Jensen-Salsbery Laboratories, Inc. (Kansas City, Mo.)	1914	1946	Veterinary ethical medicinals
Hess & Clark, Inc. (Ashland, Ohio)	1893	1955	Veterinary and animal health products
Alfred D. McKelvey Co. (New York)	1939	1941	Men's toiletries
Prince Matchabelli, Inc. (New York)	1905	1941	Women's perfumes, prestige cosmetics
J. T. Baker Chemical Co. (Phillipsburg, N. J.)	1904	1941	Industrial, pharmaceutical and laboratory chemicals
Extruded Plastics, Inc. (Norwalk, Conn.; Marion, Ind.)	1940	1953	Plastic packaging materials

New Moves: The pace is quickening in the 32-year-old International Division. Last week, Vick's latest foreign resident manager left for Japan, another step in complete removal of foreign mechandising management from the New York head office. In June, a Paris office will open to supervise operations in France, Germany and Italy; by June '57, Vick's first wholly owned foreign plant will be operating in Australia. Within a few years, the company says, all nine of its foreign groups will operate from abroad.

A company that's always done hard merchandising in the "cold" field, Vick has depended heavily on intensive market knowledge. Now it's taking the next step by putting its key men squarely into those markets.

Executive Development: Key men have come primarily from the ranks, says Mabry. Brought up through the base organizations under the firm's executive training program, which Mabry personally manages, they've been given tough field assignments in all operations, with planned emphasis on their weak points. Now Vick has a force of men ready and able to step into new openings.

The qualities Vick seeks in its men are not far different from those of other businesses. What's different, says the company, is that Vick training begins at the outset of a man's career, with analysis of his particular needs for growth. As a result, Vick's top positions are filled with able and enthusiastic young men.

Development and decentralization go hand in hand in Vick's semi-autonomous operations. Each of the operating organizations is managed by a president whose decisions and goals are basically his own. Once a year the managers meet with top Vick management, outline their aims, sell the need for approval. Then, for the next 12 months, they're largely on their own.

New Companies: Vick acquisitions, now made by a specialized department, started with Merrell in 1938, are the outgrowths of screening methods devised by Mabry himself. The new department screens "thousands" of possibilities in all lines, then makes its overture, often to the complete surprise of the prospective purchase. "Actually," says Mabry, "90% of the firms we approach haven't ever considered selling." But Vick has persuasive selling points, cites its financial stability, often makes its point to closely held companies fearful of dissolution as family management passes on.

Vick plans to keep growing. But however it grows, Vick management avers, each step will continue to be a balanced mixture of new products, new men, new ideas.

MANILA SOUND TRUCK: Decentralization based on market knowledge.

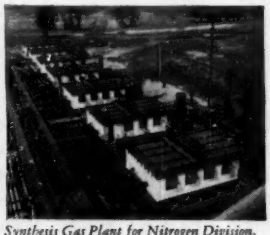
Girdler building $14,000,000 nitrogen plant ...one of largest in South

Now underway is construction of one of the largest synthetic nitrogen plants in the South. Girdler, as prime contractor, is building it for the Southern Nitrogen Co., Inc., at Savannah, Georgia.

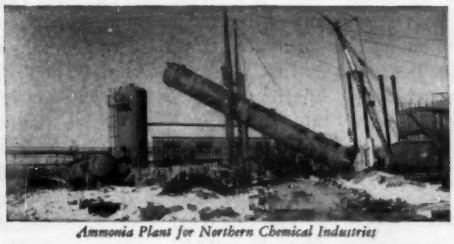
This plant, which will produce 250 tons of ammonia per day for conversion into nitrogen solutions, prilled ammonium nitrate, and urea will raise farming yields and profits in Southeastern states.

Here is another major project entrusted to Girdler. The reasons—experience, ability, and *performance*. When you plan process plant expansion or modernization use our complete service—and unit responsibility—for design, engineering, and construction. Call or write for complete information.

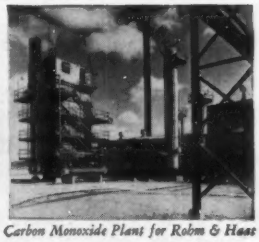
RECENT PROJECTS BY GIRDLER



Synthesis Gas Plant for Nitrogen Division, Allied Chemical & Dye Corporation



Ammonia Plant for Northern Chemical Industries



Carbon Monoxide Plant for Rohm & Haas

the GIRDLER Company

A DIVISION OF NATIONAL CYLINDER GAS COMPANY

LOUISVILLE 1, KENTUCKY

GAS PROCESSES DIVISION... Design, Engineering, Construction of Hydrocarbon Processing Plants, Gas Producing Plants, Chemical Plants. Custom-designed Catalysts. Offices: New York, San Francisco

VOTATOR DIVISION... Continuous Processing Apparatus for liquid and viscous materials. Design, Engineering, Construction of Edible Oil Plants. Offices: New York, Atlanta, Chicago, San Francisco

THERMEX DIVISION... Dielectric Heating Apparatus for materials drying, baking, curing.

CHEMICAL UNIONS' DRIFT TOWARD UNITY: 38-YEAR TIMETABLE

1918—First convention of oil workers' union, then in the AFL, at El Paso, Tex.

1935—Passage of Wagner Act stimulated organizing of chemical workers.

1938—First CIO convention, with most organized chemical workers represented by District 50, United Mine Workers.

1940—AFL began stepping up organization of chemical employees.

1941—UMW and District 50 dropped out of CIO, but some chemical locals stayed in CIO, forming nucleus of United Gas, Coke & Chemical Workers.

1942—First convention of Gas-Coke, Niagara Falls, N. Y.

1944—First convention of International Chemical Workers Union (AFL), Akron, O.

1951—Gas-Coke appealed to CIO headquarters to keep other CIO unions—notably the Oil Workers—out of the chemical jurisdiction.

1954—ICWU, Gas-Coke and the Oil Workers all signed the AFL-CIO no-raiding pact.

1955—Merger of Gas-Coke and the Oil Workers at Cleveland to form OCAW; AFL-CIO merger, New York.

1956—Feb. 6, meeting of officers of AFL-CIO's Industrial Union Dept., Miami;
March 17, meeting of ICWU and OCAW unification committees, Kansas City;
Aug. 20, OCAW convention, St. Louis;
Oct. 1, ICWU convention, Buffalo.

Speed-up on Joint Action

Another burst of activity on the part of AFL-CIO's two chemical labor unions is starting this weekend with a preliminary conference at Kansas City on the proposal for merging the two unions—Oil, Chemical & Atomic Workers and International Chemical Workers Union.

Also, both unions are continuing to press ahead on various methods of coordinated bargaining. Especially is this true of OCAW, which has been walking briskly in this direction for the past three months, is now about to break into a gallop.

OCAW Vice-President Joe Appelbaum has scheduled the organizing of no fewer than three subindustry councils and four company-wide councils for April and May. Some of these will parallel similar committees already set up by ICWU for certain of its locals, and in those cases, it can be expected that there'll ultimately be a more or less formal working agreement between the OCAW and ICWU groups, just as has been worked out by the two unions' American Cyanamid councils.

Tireless Traveler: Appelbaum's spring schedule will keep him on the road most of the time, beginning next week in Fort Smith, Ark., with a meeting of the lead and zinc industry council that he organized two months ago.

In Chicago on April 7, he'll bring together delegates from OCAW locals at Olin Mathieson plants, including those locals that have already formed a council for the E.R. Squibb pharmaceutical division of that company.

The following weekend in the same city, Appelbaum will preside at the organizational meeting of OCAW's industry-wide paint, varnish and lacquer council; and on April 21 in New York, he'll seek to set up an industry council for locals at plants making drugs, pharmaceuticals and cosmetics. He'll be in Milwaukee on April 28 to put together a gas utility council, and on April 29 to form a council for locals that have contracts with Minnesota Mining & Mfg. His May itinerary includes a visit to Syracuse, N.Y., to organize an Allied Chemical & Dye council, and another stop in Chicago to set up a Koppers company-wide council.

Go-Slow Policy: Both OCAW and ICWU are rushing to launch these councils, but they're being careful not to go too fast in trying to give the councils authority to bargain directly with the companies concerned—except on certain benefits that are usually handled on a company-wide basis, such as pension plans. Reason: most chemical company management men are opposed to multiplant bargaining on wages and hours, and most of the unions' rank-and-file members are jealous about their local autonomy.

Accordingly, the main job for the councils right now is fourfold:

- To pool information on contracts and offers at the various plants.
- To suggest bargaining tactics to be used at each plant that would benefit all the affiliated locals.
- To carry out company-wide bargaining on such matters—e.g., pensions and insurance—as are acceptable to management and local unions.
- To make whatever progress is possible toward persuading management and local unions to agree to extend the scope of company-wide bargaining.

No Whirlwind Start: Meanwhile, OCAW and ICWU are laying plans for the stepped-up organizing campaign that's expected of them, now that they're assured of some financial and personnel support from AFL-CIO's organizing department (*CW, March 3, p. 26*). Up to now, at least, there's nothing to suggest that this drive is about to get off to a whirlwind start.

OCAW has lost two recent important chemical plant elections (*see p. 44*), and the two chemical unions have run into opposition from the two textile unions that are now within the AFL-CIO house. Both the chemical and textile unions are laying claim to jurisdiction over rayon and nylon plants.

As of now, it appears pretty certain that OCAW and ICWU—either separately or merged—will be much more active on behalf of their member locals; but it's by no means certain that there's going to be any sudden increase in the number of those locals.

The world's leading **ETHYLENE** producer

also offers:

OLEFINS
OXO ALCOHOL
SULPHUR
TOLUENE

in its growing family of

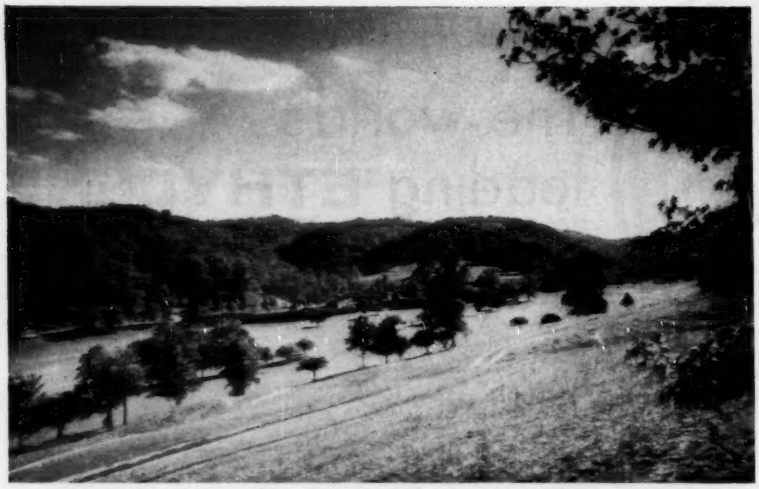
QUALITY CHEMICALS *from* PETROLEUM

You will find in Gulf chemicals the same top quality that has established Gulf as a leader in the petroleum industry for more than half a century.

The top quality of Gulf chemicals is the result of constant wide-awake research, the most modern manufacturing techniques, and the most exacting processing standards.

We invite your inquiries—write, wire or phone

Chemical Department
Gulf Oil Corporation
P. O. Box 1166, Pittsburgh 30, Pa.



HILL AND DALE: Open country in the Kanawha Valley beckons as . . .

Employees Bargain for Fun

A 194-acre recreation area for employees, with artificial lake, archery range, baseball diamond, swimming pool, picnic grounds, tennis courts and improvements for the existing 18-hole golf course — all without any direct subsidy from the company. That's the picture at Belle, W. Va., where 1,040 employees of Du Pont's nonunionized Belle Works have banded together to finance their own recreation facilities.

Not seeking Du Pont aid, these employees—all members of the Belle Works Employes Activities Assn.—subscribed the $250,000 purchase price by buying two $100 shares each to pick up options due to expire Feb. 29. Now a company, Meadowbrook Land Co., has been formed under BWEAA sponsorship, and when purchase contracts are completed, an operating company will be set up.

Company Happy: Unofficially, Du Pont is smiling upon the project, although no offers of, or requests for, assistance have been made. BWEAA membership includes employees from every echelon at the plant, and operators and management alike have taken an active interest in promoting the deal. Obviously, the common undertaking has had considerable, and probably will have more, cohesive effect on *esprit de corps* among plant personnel.

So far, plans call for the facilities to be at the disposal of employees only, with the exception of the golf course, which has been a public area for 26 years. The town itself has recommended in the past that citizens take over the site as a park, but interest in it never gained sufficient headway to warrant taking the appropriate steps. Some circles suggest Du Pont made no corporate overtures for fear of engendering criticism among the townspeople; an employee undertaking, however, with the golf course remaining public, would stir just the opposite sentiment.

Active efforts to secure the land started last October, when the association secured 60-day options. These were renewed at the first of the year when only 900 employees had bought shares. But an intensified selling campaign brought in the required sums during February.

Probable Help: There's small doubt that Du Pont will at least indirectly lend aid to the various programs conducted in the area. It now actively supports most employee affairs, including 15 social activities and 9 sports leagues. Moreover, the company owns and maintains a large building adjacent to the Belle site, which serves as a clubhouse, dining room and auditorium for plant groups and various civic organizations in the town of Belle.

How fast the project will develop, and to what extent Du Pont may formally contribute, nobody's guessing. But in view of announced union targeting of Du Pont, a project as morale building as the recreation area is sure to have the company's tacit, if not expressed, blessing.

And to Du Pont and all other chemical companies that have spent many a penny on ball diamonds and barbecue pits, this action by the self-reliant employees at the Belle Works may point the way to well-rounded recreation programs that relieve the drains on company funds.

Three Pay Plans

Supplementary pay plans for chemical and pharmaceutical employees are crowding into the news this week. In each development, the net effect is to make employees feel closer to the company, more directly concerned with profit-and-loss matters.

Joining the still-minute circle of chemical concerns with stock purchase plans for rank-and-file employees is National Distillers Products Corp. (*CW, March 10, p. 16*). Each employee may invest up to 5% of base earnings through payroll deductions, and the company will contribute 25¢ for each $1 put up by an employee. The savings can go into ND common stock, U. S. savings bonds, or both. The plan also covers employees of ND subsidiary National Petro-Chemicals Corp.

Atlas Powder is taking steps to make sure that employees understand their disability wage plan, a fringe benefit financed by the company. In place of the original explanatory booklet—which had no illustrations and used legalistic phraseology—Atlas is distributing a 10-page pamphlet that uses "a simplified graphic approach," mostly based on question-and-answer presentation. The plan provides for up to 13 weeks' coverage at two-thirds of scheduled weekly wage rates.

And in Milwaukee, Lakeside Laboratories is informing its employees that their average equity in the company's unusual profit-sharing and retirement fund has risen to more than $2,950. The fund grew to $793,634 during the past year, with a company contribution of $97,575 and earnings of $73,599 on investments from the fund.

The company's contributions are figured at 15% of all company earnings in excess of 10% of the firm's net worth.

Eastman

acids and anhydrides

—"the standard of the industry"

Simplify the control of your processing operations with uniformly high quality Eastman acids and anhydrides. Known as the "standard of the industry," they are your assurance of a uniform product no matter when or in what quantities they are ordered. For more information, samples or specifications, write to Eastman Chemical Products, Inc., Chemicals Division, Kingsport, Tennessee.

acetic acid

- Organic synthesis
- Reaction medium and solvent
- Dyeing assistant

acetic anhydride

- Acetylating agent
- Dehydrating agent in nitration and sulfonation reactions, etc.

propionic acid

- Calcium or sodium salt used as bread mold inhibitor
- Raw material for herbicides

n-butyric acid

- For the preparation of butyric esters useful in formulating perfumes and flavorings

n-butyric anhydride

- Acylating agent
- Intermediate

isobutyric acid

- As a starting point for the synthesis of plasticizers, perfume materials and lacquer solvents

isobutyric anhydride

- For the preparation of aromatic esters for perfumes

Eastman
CHEMICAL PRODUCTS, INC.
KINGSPORT, TENNESSEE
subsidiary of Eastman Kodak Company

SALES OFFICES: Eastman Chemical Products, Inc., Kingsport, Tennessee; New York City; Framingham, Massachusetts; Cincinnati; Cleveland; Chicago; Houston; St. Louis. **West Coast: Wilson Meyer Co.,** San Francisco; Los Angeles; Portland; Salt Lake City; Seattle.

BRITISH APPRENTICES: At Billingham, a top management policy to . . .

Take More Time to Train

Full-time training or on-the-job training—which is the better way to train young men for skilled work in chemical plants?

Major U.S. chemical companies usually sponsor the on-the-job plan, often with state labor departments and craft-type labor unions as cosponsors. Courses run up to four years in length, help workers qualify as journeymen electricians, plumbers, patternmakers, etc., while working a full 40-hour week.

Now, however, the other system is getting an important field trial in England, where Imperial Chemical Industries, Ltd.—largest chemical concern in the British Commonwealth—is putting up a $250,000 school building at its huge Billingham works to transmute 16-year-old recruits into tradesmen. To be completed this June, it's slated to turn out about 100 artisans each year.

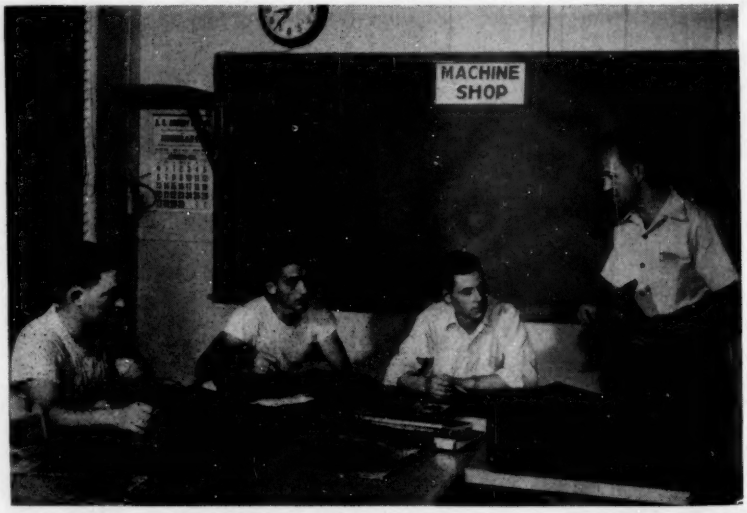
No Counterpart Here: There's no chemical counterpart to the British innovation here, partly, of course, because U.S. chemical companies generally don't take on 15- and 16-year-old boys as factory workers. In Britain, the educational system is such that boys who aren't going to enter college are available for work when they are a year or two younger than most high school graduates in the U.S.

Over here, new employees in chemical plants are often high school graduates, 18 or 19 years old, many of whom have taken such courses as woodworking, metal working, mechanical drawing. They're fairly well prepared for the starting jobs, but they want to move up as rapidly as possible into better-paying classifications; and—particularly in maintenance work—this frequently means following a prescribed regimen of shop practice, lectures and homework to become a licensed or journeyman craftsman.

Leading chemical concerns in the U.S. have found that it's to their advantage to help these young men acquire advanced skills, and have set up apprentice training programs—usually on a plant-by-plant basis—to handle the work. Dow Chemical, for example, has built up an educational department that offers complete journeyman training courses for nearly every usual trade and for some highly unusual ones. At Midland—where Dow has some 500 buildings and a maintenance crew of more than 2,200—Dow management has consistently held that training is the responsibility of line supervision; the educational department is fundamentally a service organization that systematically helps line supervisors discharge their training duties.

Half-Time Training: Du Pont has formal four-year apprentice training programs at 15 of its U.S. plants, all on-the-job plans. In addition, Du Pont's engineering department is sometimes called on to set up special temporary training programs to meet particular plant needs, as when a new plant is going onstream or when a new process is introduced. In those cases, workers work half-time, spend the rest of their workdays in training.

Monsanto, Hercules, and Food Machinery & Chemical are other large



YANKEE LEARNERS: At Midland, it's up to the line organization.

PHONE PICCO

for **WAREHOUSE SHIPMENT**

when you need

RESINS

SOLVENTS

OILS

Local Picco Addresses and Phone Numbers

DISTRICT	WAREHOUSE	ADDRESS	PHONE NUMBER
New England	Eastern States Warehouse	675 Concord Street Cambridge, Mass.	Phone Boston at Commonwealth 6-3938
New York	J. Leo Cooke Warehouse Corp.	140 Bay Street Jersey City, N.J.	Murrayhill 2-9146
Philadelphia	Penna. Industrial Chemical Corp.	Jeffrey at Delaware Streets Chester, Penna.	Chester 4-4381
South Atlantic	Fulton Warehouse	544 Means Street, N.W. Atlanta, Ga.	Walnut 9257
Pittsburgh	Penna. Industrial Chemical Corp.	State Street Clairton, Pa.	Belmont 3-8600
Detroit	D. H. Overmyer Warehouse Co.	1197 West 67th Street Cleveland, Ohio	Phone Detroit collect at Woodward 3-5020
	Jefferson Terminal Warehouse	1900 East Jefferson Street Detroit 7, Mich.	Woodward 3-5020
	William B. Tabler Co.	1029 West Main Street Louisville 2, Ky.	Clay 7666
	Cincinnati Transfer Co.	1440 West Eighth Street Cincinnati, Ohio	Cherry 1-0080
Chicago	Witco Chemical Company	457 East South Water Street Chicago, Illinois	Wabash 2-8167
	Rutger Street Warehouse, Inc.	Main and Rutger Streets St. Louis, Missouri	Forest 1-6440
Pacific Coast	Pacific Commercial Warehouse	2014 East Fifteenth Street Los Angeles, Calif.	Dunkirk 7-5201
	San Francisco Warehouse Co.	645 Third Street San Francisco, Calif.	Ordway 3-0345

PENNSYLVANIA INDUSTRIAL CHEMICAL CORP.

Clairton, Pennsylvania

Plants at:

Clairton, Pa.; West Elizabeth, Pa.; and Chester, Pa.

Sales Offices

Boston, New York, Detroit, Chicago, Cincinnati

Los Angeles, Philadelphia, Pittsburgh

PENNSYLVANIA INDUSTRIAL CHEMICAL CORPORATION

PICCO

SCHOOLBOYS TO FACTORY WORKERS: TWO ROUTES

(General plan for ICI's new apprentice training school at Billingham, England)

100 recruits selected for training are sent first to the —

FITTING BAY
(use and care of hand tools)

After 3 months, 30 boys selected for 6-month course go to —

HANDICRAFT BAY
(3 months' basic training in welding, plumbing, bricklaying, etc.)

After 4 months, 70 boys selected for 12-month course go to —

MACHINE BAY
(4 months of machine tool practice)

. . . then to —
PRODUCTION BAY
(4 months' basic training for pipefitters, lathe operators, electricians, instrument technicians, etc.)

Then are assigned to various ICI PLANTS

U.S. chemical concerns that have been conducting formal on-the-job apprentice training programs for a number of years; and Union Carbide's Carbide and Carbon Chemicals has adopted similar courses, notably at its Texas plants.

But ICI feels that for its particular situation, full-time training is the answer. While every manufacturer needs a steady supply of new workmen, ICI's problem has been compounded by its more than $456-million expansion program since 1946; and before that, by the manpower shortage during World War II.

Five-Year Training: Back in 1941, ICI appointed a full-time apprentice supervisor to try to cope with the problem. Craft training at that time consisted of moving apprentices from plant to plant during their five-year training period, with on-the-job instruction from supervisors and skilled craftsmen.

It became apparent, though, that this system wouldn't provide enough skilled workers for the mushrooming concern, and in '43, a committee was appointed to make recommendations on postwar training. That group suggested that a training school at Billingham would increase the number of apprentices ready for factory jobs and also relieve the supervisors and craftsmen of many of their training chores.

The school was started in 1946, using converted factory buildings—the only space available at the Billingham works. Early results were encouraging, even though the school could take in only 57 boys at a time, and for only a few months of training.

Management then took the next step: setting up the full-time apprentice training school that's due to open in its own building in June. With courses for all needed trades (*see box, above*), it's hoped that this school will make Billingham nearly self-sufficient in maintenance personnel. Advanced training will be offered to promising employees who've had about two years' experience in the plants. The system probably isn't so suitable for the U.S., but it may prove to be just the ticket for ICI in England.

Power Pinch Seen

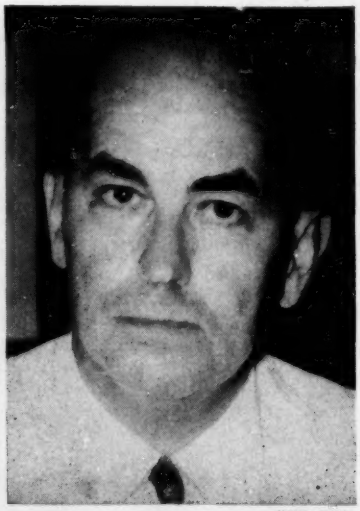
For chemical management in the Tennessee Valley, the threat of curtailed electric power because of low rainfall (*CW Newsletter, Jan. 21*) has been eclipsed by a warning that the valley's supply of steam-generated electricity is on shaky footing.

Hydroelectric power production by the Tennessee Valley Authority is on the upswing now, following heavy rains last month over the Tennessee and Cumberland watersheds. But a veteran of the area's coal industry is lashing out at TVA's directors for a policy that he charges has "seriously endangered" the safety and welfare of the valley's people and the operating stability of its industrial plants.

Nashville's Justin Potter, former president of Nashville Coal Co. and various subsidiary coal producers, says that TVA is failing to maintain an adequate fuel supply at its steam power plants—which account for more than two-thirds of all TVA power.

Potter says that coal stocks at TVA steam plants are enough to run those generators for periods ranging from one to six weeks. He insists that each plant should stock enough coal to last three months if necessary, citing the danger that coal deliveries might be cut off because of a possible strike by the coal miners or the railroad workers.

TVA Chairman Herbert Vogel says his agency's coal purchasing is all carried out in accordance with law, adds that more than four-fifths of coal received during the past year was bought under contracts of terms ranging from six months to three years.



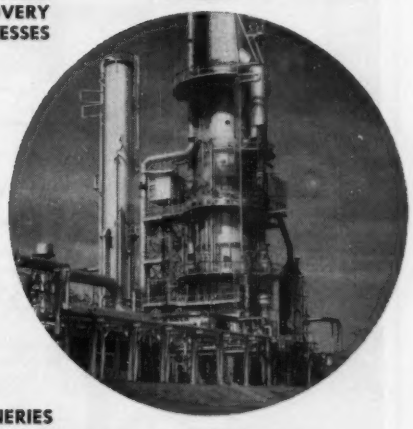
WIDE WORLD

TVA'S VOGEL: For valley's industry, assured power or calculated risk?

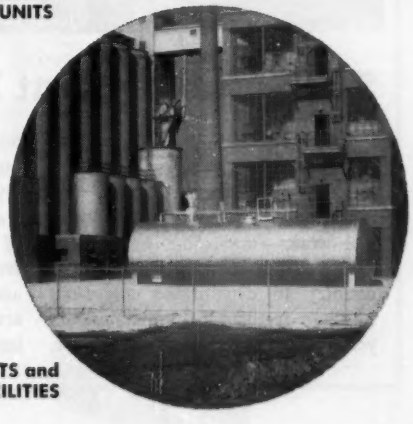
Blaw-Knox engineering and construction service

• FERTILIZER PLANTS, LIQUID or DRY PROCESS

• SOLVENT EXTRACTION, FAT SPLITTING, FATTY ACID and GLYCERINE RECOVERY PROCESSES



• PETROLEUM REFINERIES or SINGLE UNITS



• FEED PLANTS and STORAGE FACILITIES

Blaw-Knox engineers have long experience in the design, engineering, procurement, construction and initial operation of all types of process plants. This experience is available for new additions to existing operations, as well as for remodeling and modernizing older units. Why not consult Blaw-Knox engineers on your plans for expansion of facilities, broadening of markets, or revamping of obsolete plant and equipment?

BLAW-KNOX COMPANY
Chemical Plants Division
Chicago 1, Illinois / Pittsburgh 30, Pa.
Birmingham, New York, Philadelphia, San Francisco, Washington, D.C.

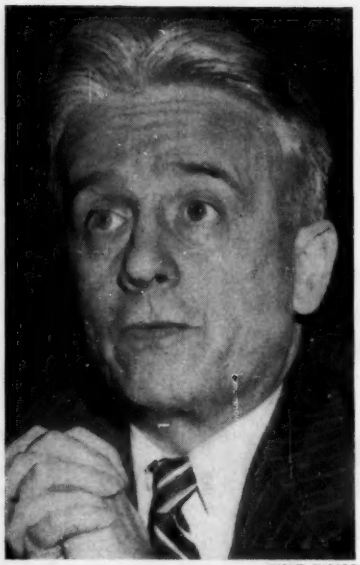
complete plants, large or small, or a single unit

New Polychemical Contender

Polychemical makers are worrying about the latest entry in the fast-growing polyethylene business. Groundbreaking in Louisiana last week marked the beginnings of W. R. Grace's (New York) $18-million, 50-million-lbs./year polyethylene plant, plus the organization of a new Polymer Chemicals Division. The new division will rank with Grace's other operating groups, including Grace Chemical Research and Development division, Davison and three new divisions just created out of Dewey and Almy (D&A, D&A Overseas, Cryovac).

Though currently called largely an operational reorganization, it seems likely the new division will go more extensively into polychemical development than Grace has done thus far. With a $7-million, one-year budget scheduled for the Research and Development division, Grace spokesmen "would be surprised if nothing came out of it for Polymer Chemicals."

Little more than setting up the organization has been done yet, but polychemical producers can anticipate that Grace will turn out to be a potent contender in this field.



WIDE WORLD

NEW YORK'S KEATING: In new antitrust probe, too much politics?

KASTPOTO

Self-Sufficiency at Last

COMMUNIST POLAND says that this nitric acid unit at Kedzierzyn—reconstructed from the ruins of a former Nazi-built chemical works—and other new plants are making it possible for that country to discontinue importing nitrogen fertilizers. In the past six years, the Polish government says, 50 new chemical plants have been built; others are under construction. Over-all chemical output in 1954 was reported as seven times that of '38, with production of nitrogen fertilizers up 58% from '54 to '55 and sulfuric up 10%. Chemicals are becoming the country's second largest industry, next to coal.

LEGAL

Political Football: As election time rolls around, politics-generated antitrust action may be on the upswing, if charges by Rep. Kenneth Keating, (R., N.Y.) are borne out. Keating says House Democrats are playing politics by getting federal control agencies to criticize each other. Focal point of his attack was an inquiry ordered by Rep. Emanuel Celler (D., N.Y.) reportedly without consulting Republican members of the Judiciary subcommittee. Celler says the inquiry's aim is to determine whether government regulatory agencies have become "unduly responsive to the dictates of the industries that they regulate." Keating responds that he does not oppose the inquiry *per se* because it might serve a worthwhile purpose in revealing "the facts about the big business bogey."

•

Trade Practice Laws: Steps to strengthen state trade practice laws are in varying stages of development. In New York, a legislative proposal pending in the legislature would permit incorporated trade associations whose membership is affected by "unfair" competition to bring injunction suits against state "fair trade" law violators. In South Carolina, a bill has been introduced to "put teeth into the state's unfair trade practices act."

FAMOUS LIGHTHOUSES OF AMERICA

STANNARD ROCK LIGHTHOUSE, Lake Superior, Michigan, is located about 23 miles southeast of Manitou Island. Completed in 1883, the stone tower is built on a base of concrete and stone which stands on solid rock in 11 feet of water. The light, 102 feet above water and visible for 18 miles, protects shipping in a dangerous area on the heavily traveled trade route between Duluth and the lower lakes.

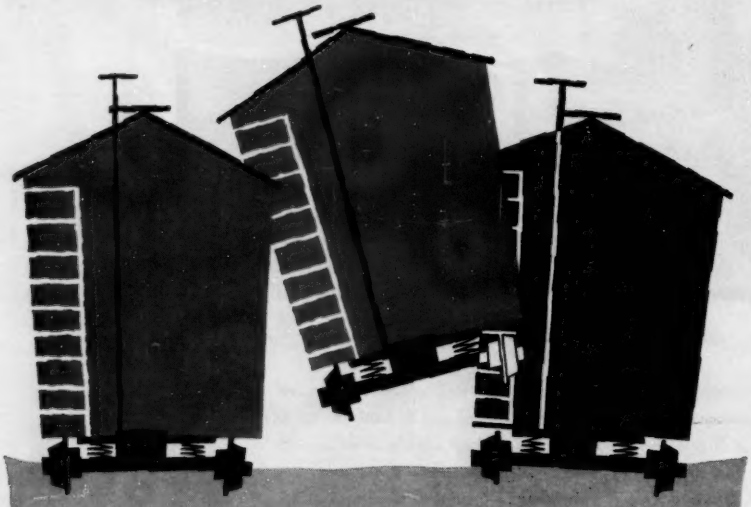
Protection for the quality of your products and the efficiency of your processes is provided by the uniformly high standards of Niagara Alkali and the Hooker Electrochemical Company's years of experience. Depend on the purity and uniformity of Nialk® Caustic Potash, Carbonate of Potash, Trichlorethylene, Niagathal® (Tetrachloro Phthalic Anhydride).

NIAGARA ALKALI DIVISION
HOOKER ELECTROCHEMICAL COMPANY

4726 Buffalo Avenue, Niagara Falls, New York

HOOKER® CHEMICALS & PLASTICS

You can buy MIXED carloads of



PHOSPHATES from Maas

The largest producer with the most complete line of phosphates and photo chemicals in the West.

ARMOFOS (tripoly) • TRISODIUM PHOSPHATE
DISODIUM PHOSPHATE • DRI-TRI (anhyd. tsp)
TETRASODIUM PYROPHOSPHATE
SODIUM ACID PYROPHOSPHATE
MONOSODIUM PHOSPHATE

Write for descriptive folder.

A. R. MAAS CHEMICAL CO.
Division of Victor Chemical Works
4570 Ardine Street • South Gate, Calif.

ADMINISTRATION. . .

State Rep. George Harrell explains that a weakness of the present law is failure to define cost with regard to "unfair" below-cost selling. Harrell's measure would define cost as "the invoice cost of the merchandise" or the "replacement cost of the merchandise." The measure would also permit trade associations to seek injunctions and civil damages against violators.

•

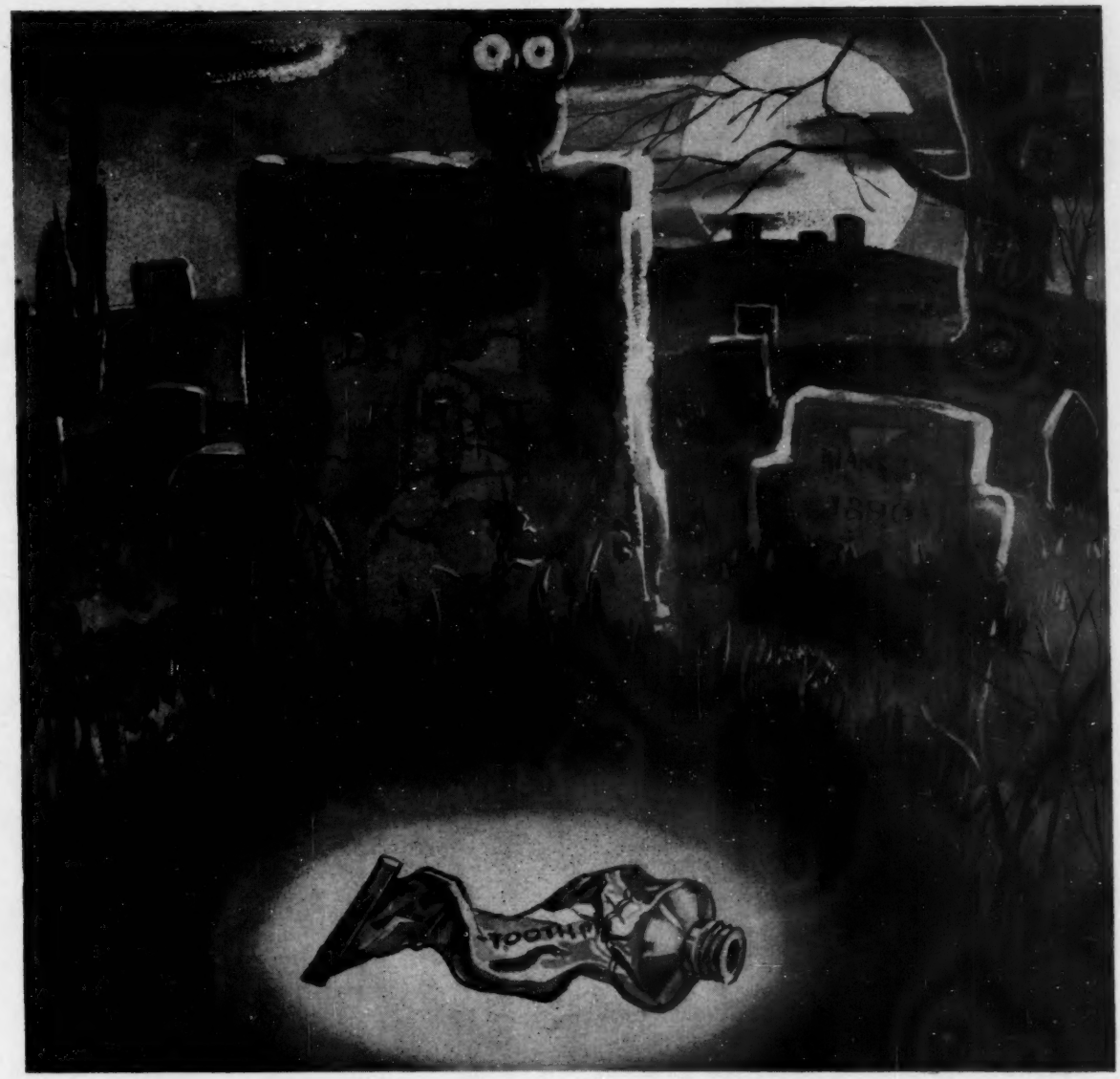
Similarity in Sound: Trademarks, particularly in foreign languages, can have similar sounds and appearance without infringing on one another, according to a decision last week by Federal Judge Edmund Palmieri in New York. The judge dismissed a suit by Jean Patou, Inc. (New York), against the French perfume manufacturer, F. Millot, in which the U.S. firm had charged Millot's trademark Joyeuse Nuit was confusingly similar to Patou's two trademarks Joy and La Joie de Jean Patou. The issue had been heard previously by the trademark examiner, was later appealed to the Commissioner of Patents. In court, Patou introduced new evidence, a label showing Millot's emphasis on the word Joy in his trademark, but Judge Palmieri said the findings of the Patent Office outweighed the new evidence, said the trademarks had not been shown to be deceivingly or confusingly alike.

LABOR. . . . . .

Two Severe Setbacks: While hatching plans for an all-out organizing drive backed by the AFL-CIO, the Oil, Chemical & Atomic Workers Union has dropped two important plant elections.

In one recent bid for bargaining rights, OCAW had to buck the efforts of a sister AFL-CIO union, the Office Employees International Union. Result: both unions lost out. This election was for white-collar workers in three Carborundum Co. plants near Niagara Falls, N.Y. There were 229 ballots for OEIU, 76 for OCAW, and 321 for "no union," with only 49 eligible employees failing to vote.

At Orange, Tex., OCAW was the only union on the ballot in an election for 163 hourly paid production and maintenance workers at the Spencer Chemical plant, received only 35 votes while 124 employees declared for "no union."



How does a toothpaste die?

No brand just dies. It's squeezed out of existence by better, faster-selling competitors.

The up-and-coming brands right now – *those selling the most, the fastest* – are VEEGUM formulated.

Does your brand belong to this alert, new group?

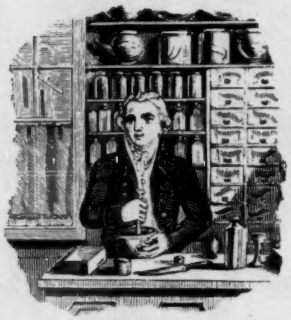
At a suggestion from your research group, we can show you what this new generation is up to, and what VEEGUM has to do with it.

VEEGUM is a unique, inorganic binding, bodying and emulsifying agent.

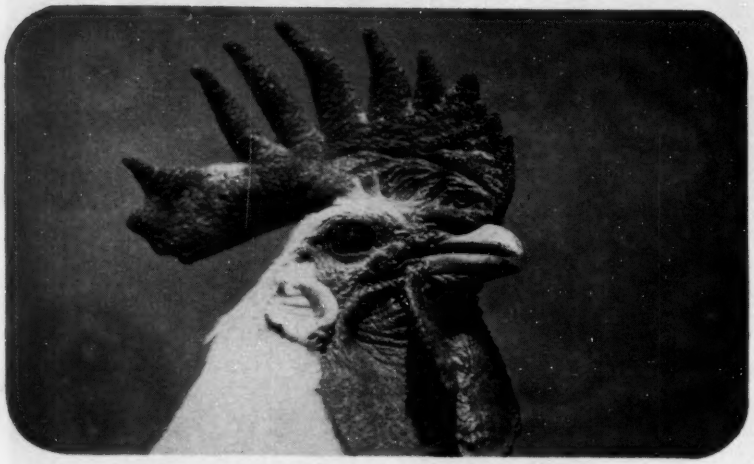
R. T. VANDERBILT CO.
SPECIALTIES DEPARTMENT
230 PARK AVENUE, NEW YORK 17, N. Y.

Routing the Raillietina cesticillus... with

Tin Chemicals



In 1803 *Dr. John Ford of London noted that when granulated tin was used as a purge for worms in humans, it also functioned as an excellent sedative. As such he prescribed it in several cases of hypertension. Tin remained Dr. Ford's special sedative for years and England's standard worm remedy for nearly a century.*



TODAY a compound of tin is doing a remarkable job as an anti-wormant in veterinary medicine. A few years ago Dr. Salsbury's Laboratories, pioneers in poultry pharmaceuticals, were looking for a chemical that would be non-toxic for poultry, but effective against the deadly poultry tapeworm, Raillietina cesticillus. For experimental purposes hundreds of compounds of tin were supplied by Metal & Thermit. M & T Dibutyltin Dilaurate is now contained in two patented formulations of Dr. Salsbury's "Wormal," one of the most effective poultry tapewormers ever developed.

•

THE VERSATILITY OF TIN CHEMICALS is by no means limited to medicine. In *any* field—automotive, aviation, textile, food, plastics—if you're looking for ways to lower costs or improve techniques, it will pay you to get in touch with us—

TIN & TIN CHEMICALS
CERAMIC MATERIALS
ORGANIC COATINGS
WELDING SUPPLIES
RADIOGRAPHIC EQUIPMENT
PLATING MATERIALS
METALS & ALLOYS
HEAVY MELTING SCRAP

"First Name in Tin Chemicals"

METAL & THERMIT
CORPORATION
100 EAST 42nd STREET • NEW YORK 17, N. Y.

ADMINISTRATION. . .

WIDE WORLD

AFL-CIO'S MEANY: In Southern organizing, a sudden slowdown.

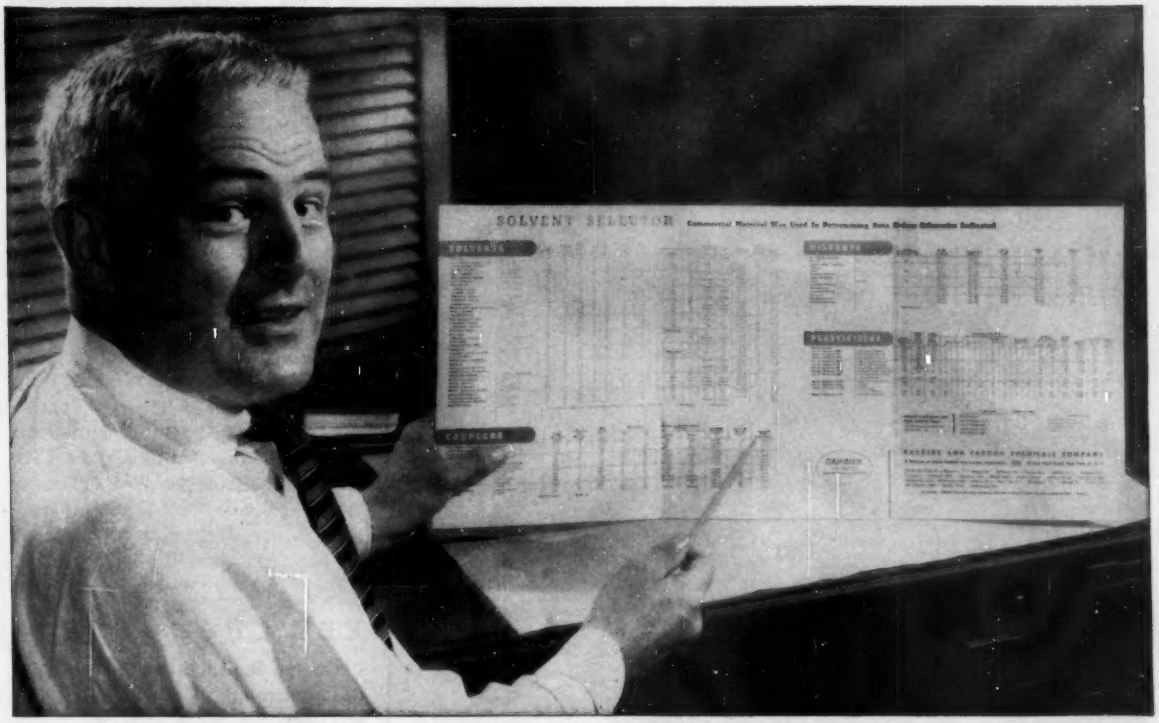
But in Canada, OCAW is making some headway against a non-AFL-CIO rival. Following recent action by the Canadian Congress of Labor to disaffiliate the United Mine Workers and UMW's District 50, OCAW has been seeking to take over some of District 50's chemical bargaining units in Canada, has picked up two plant locals this way. At Sarnia, Ont., Dow of Canada employees voted 346 to 62 for the switch; and at Long Branch, Ont., workers of Canadian Pittsburgh Paint Ltd. approved the move to OCAW by 66 to 5.

•

GAW Plan Shunned: While putting together a list of demands to be made in bargaining with the steel companies later this year, the United Steelworkers (AFL-CIO) took time out to refuse a layoff pay plan offered by International Nickel Co. Steelworkers' President David McDonald—who has committed himself to getting from the steel companies this year a supplementary unemployment benefit program more liberal than last year's Ford and General Motors layoff pay plans—has spurned Inco's proposal because it calls for contributory payments by employees and individual funding.

•

Slowdown in the South: Current tension over desegregation has slammed the brakes on AFL-CIO organizing in the Deep South. Chemical union



Looking for the best type of **Solvent?**

"CARBIDE'S" SOLVENT SELECTOR CAN HELP YOU.

The Solvent Selector is written to provide you with unbiased, essential data on active solvents, couplers, and diluents—a total of almost 70 compounds.

To help save your time, this information also is arranged for immediate reference and comparison. Just send in the handy coupon for your copy of the Solvent Selector.

Whatever your solvent needs, you'll always benefit from the availability of CARBIDE's complete range of esters, ketones, alcohols, and glycol-ethers—plus many other types of solvents for specialized applications. The big benefit is that you can choose the solvent or solvent combination which best suits your requirements. In addition, CARBIDE's strong raw material position assures you of constant availability and dependable delivery.

CARBIDE
AND CARBON
CHEMICALS

Carbide and Carbon Chemicals Company
A Division of
Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.

In Canada: Carbide Chemicals Company
Division of Union Carbide Canada Limited,
Montreal and Toronto

Send in this coupon for your copy of the Solvent Selector.

CARBIDE AND CARBON CHEMICALS COMPANY
Room 308, 30 East 42nd Street, New York 17, N. Y.

Please send me the Solvent Selector—a six-page folder presenting the latest data on solvents, plasticizers, couplers and diluents.

Name_____

Company_____

Street_____

City_____ Zone_____ State_____

This is an unretouched photo of your wife's good friend

It's a handful of sodium tripolyphosphate, one of several phosphate products made by Shea.

Mixed with other chemicals, it makes possible today's miracle washday products. It constitutes as much as 40% of the bulk content in today's best-selling detergents — helps them make clothes and dishes come cleaner . . . easier, faster.

Shea has rapidly become a major producer of sodium phosphates for detergent manufacturers. In other industries, too, Shea is writing important new chapters where progress depends on phosphorus chemicals of unquestioned quality.

Can your company profit from Shea's experience, widespread plant facilities and flexibility?

Sodium Tripolyphosphate
Tetrasodium Pyrophosphate
Disodium Phosphate
Trisodium Phosphate
Sodium Hexametaphosphate
Phosphoric Acid
Dicalcium Phosphate
Feed Grade
Phosphate Feed Solution

SHEA CHEMICAL CORPORATION
Jeffersonville, Indiana • New York 16, New York

ADMINISTRATION. . .

organizers in this area are finding it difficult to talk to Negro workers without alienating white workers, and vice versa. One thing that has aroused certain extremist elements against union organizers: sweeping statements that have been made recently by AFL-CIO chief George Meany demanding complete integration now.

•

Two Strikes Settled: Ended last fortnight: a three-day strike by District 50, United Mine Workers, at the Ethyl plant at Baton Rouge, La.; and a three-week strike by International Chemical Workers Union (AFL-CIO) at the Louisville fertilizer plant of W. R. Grace & Co.'s Davison Chemical Division. Wage increases: 15¢ and 6¢/hour, respectively.

KEY CHANGES. . .

George B. Hamilton, to vice-president, International Minerals & Chemical Corp. (Chicago).

Charles L. Holbert, to vice-president, H. K. Porter Co., Inc. (New York).

Earl P. Stevenson, to board chairman, and **Raymond Stevens,** to president, Arthur D. Little, Inc. (Cambridge, Mass.).

Daniel H. Lipman, to director, Stein, Hall & Co., Inc. (New York).

Herbert E. Silcox, to technical director, chemical division, Merck & Co., Inc. (Rahway, N.J.).

W. Joseph Straus, to director, Haveg Industries Inc. (New York).

Frank F. Black, to manager, organic chemical department, Cowles Chemical Co. (Cleveland).

Glenn H. Shakley, to treasurer, Body Bros., Inc. (Bedford, O.).

Donald J. Gage, to president, and **Robert H. MacLaren,** to vice-president, Gage Products Co. (Ferndale, Calif.).

George W. Russell, to general manager, and **Alden R. Loosli,** to assistant general manager, industrial chemicals division, American Cyanamid Co. (New York).

S. F. Thune, to vice-president, sales, national adhesives division, National Starch Products, Inc. (New York).

EXTRUSION PRESS
MORGANTON, N. C., PLANT

AS PARTNERS IN
YOUR PROGRESS . . .

OUR MANUFACTURING SKILL – is a *plus* factor!

Each process stage in the manufacture of electrodes, anodes, mold stock and carbon brick must be skillfully engineered to obtain the particular end-use chemical and physical properties desired.

The advanced handling techniques and quality control safeguards developed by our engineers and technicians give customers an important *plus factor* in the reliability of GLC carbon and graphite products.

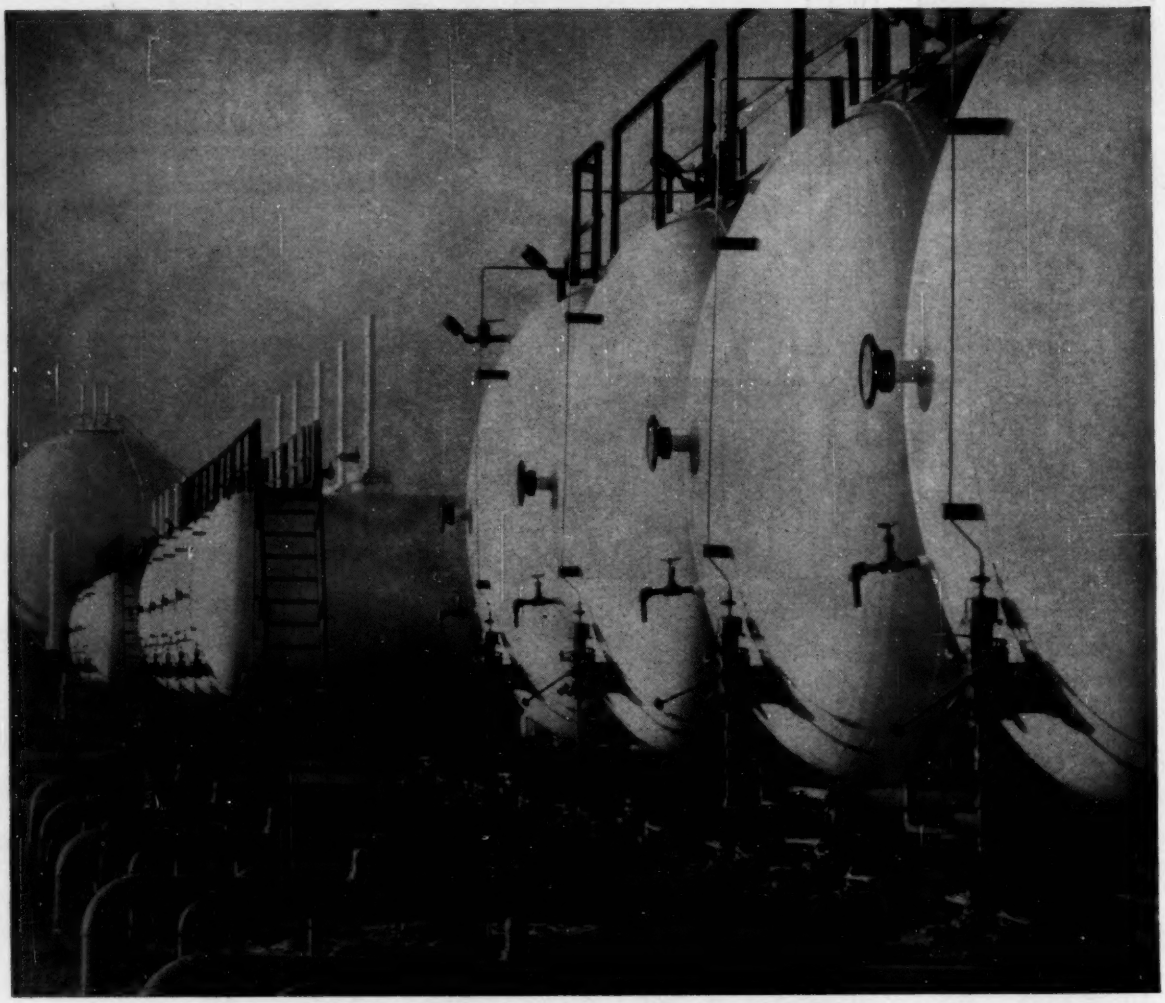
The high degree of integration between discoveries in our research laboratories, refinements in processing raw materials, and improved manufacturing methods is further assurance of excellent product performance.

ELECTRODE
GLC®
DIVISION

Great Lakes Carbon Corporation

GRAPHITE ELECTRODES, ANODES, MOLDS and SPECIALTIES

ADMINISTRATIVE OFFICE: 18 East 48th Street, New York 17, N. Y. PLANTS: Niagara Falls, N. Y., Morganton, N. C. OTHER OFFICES: Niagara Falls, N. Y., Oak Park, Ill., Pittsburgh, Pa. SALES AGENTS: J. B. Hayes Company, Birmingham, Ala., George O. O'Hara, Wilmington, Cal. SALES AGENTS IN OTHER COUNTRIES: Great Northern Carbon & Chemical Co., Ltd., Montreal, Canada; Great Eastern Carbon & Chemical Co., Inc., Chiyoda-Ku, Tokyo, Japan



A small part of the huge hydrocarbon storage tank farm above and below ground at Petro. Propane is stored in the cylindrical tanks, butane and natural gasoline in the bubble-shaped Hortonspheres. Additional propane is stored in man-made caverns 330 feet down.

Petrochemicals . . .

from pipeline gases

At the Petro plant—Tuscola, Illinois—an endless stream of natural gas is being separated into ethane, propane, butane and natural gasoline.

products you need

The ethane is converted into ethylene, which is in turn converted to ethyl chloride, ethyl alcohol, ether and polyethylene. U.S.I. ammonia and sulfuric acid plants next door supply and receive raw materials.

for the future

Petro can manufacture products other than these if the demand arises—products that can be made from the many raw materials available at the plant site.

in bulk quantity

Why not add this plant to your facilities? Our engineers will be glad to discuss your long-term bulk requirements for chemicals from National Petrochemicals Corporation.

NATIONAL PETRO-CHEMICALS

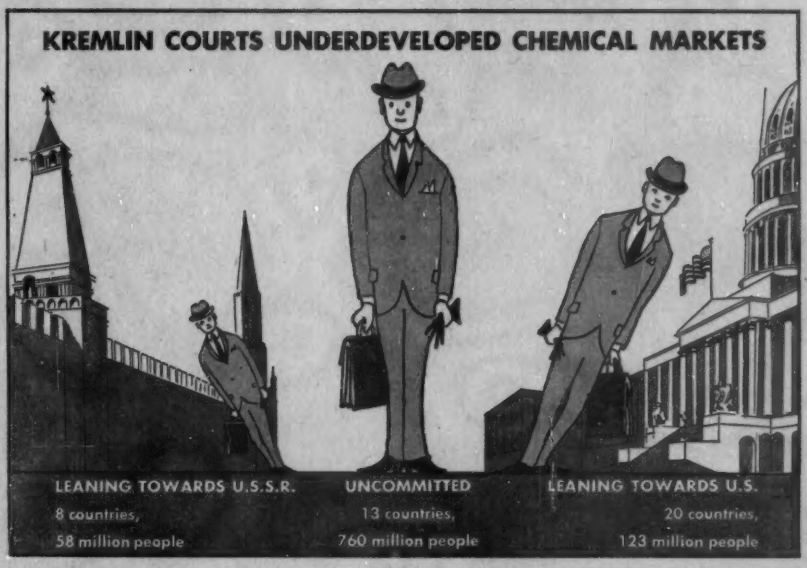
CORPORATION

A joint enterprise of National Distillers Products Corporation and Panhandle Eastern Pipeline Company

99 PARK AVENUE, NEW YORK 16, N. Y.

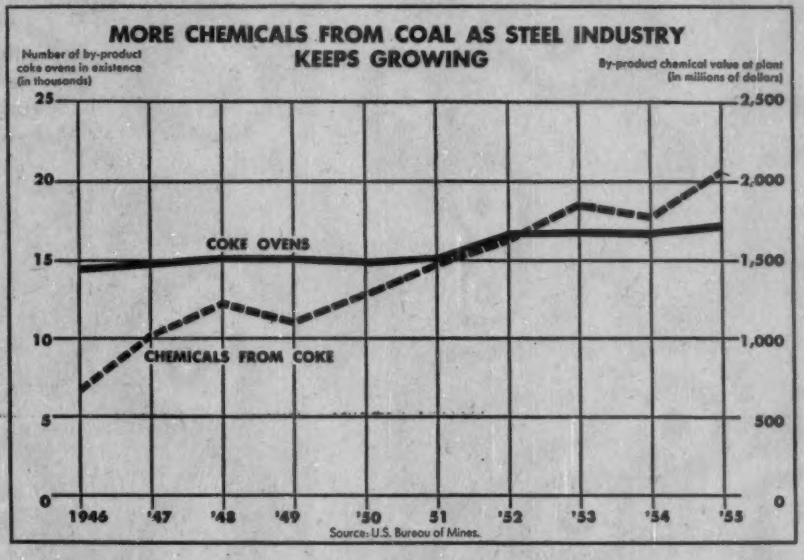
Charting Business

CHEMICAL WEEK
March 17, 1956



RECENT Soviet overtures to "neutral" and underdeveloped countries could mean a possible loss of important present and potential export markets to U.S. chemical producers. Of those nations now being wooed by Moscow, eight in the Middle East are leaning toward the Kremlin; 20 in Latin America still favor trading with the U.S.; and 13 in southern and eastern Asia are as yet uncommitted.

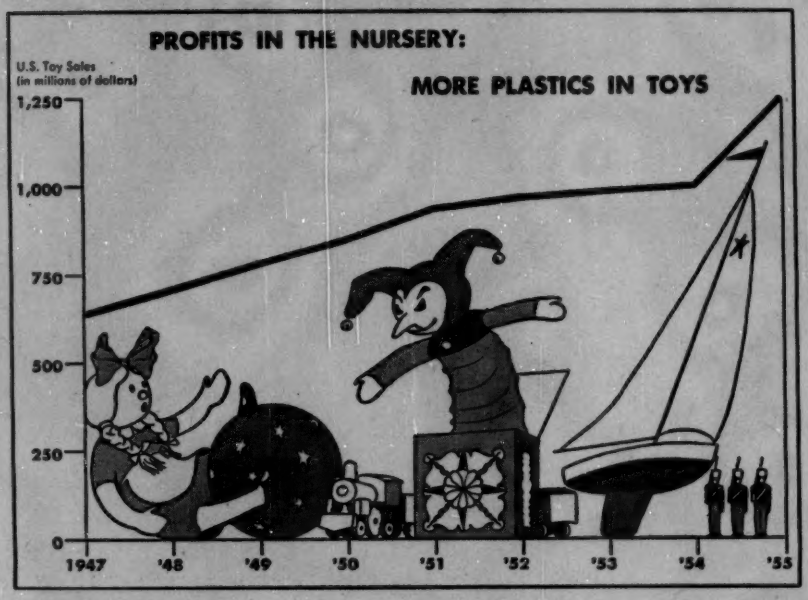
In 1954, those 41 countries bought a total of $339 million worth of chemicals from U.S. concerns. More than two-thirds of that volume went to Latin America; but populous Asia represents a still larger potential market.



AS THE steel industry goes, so goes the business of manufacturing chemicals from by-product coke ovens. Impressive growth of steel companies over the past decade has brought an 18% increase in number of slot-type (by-product) ovens, making possible a 213% rise in dollar-value output of coke chemicals. Most of that rise was due to higher coke production for busy steel mills.

Charting Business

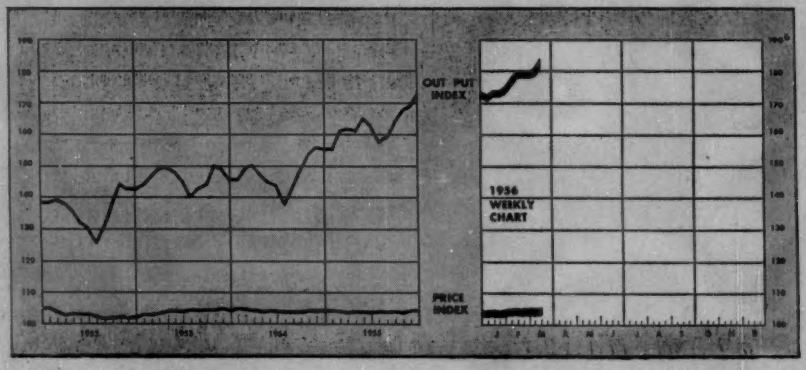
(Continued)



INCREASING use of plastics in toys is a growing market for U.S. makers of resins and plasticizers. Last year, U.S. families spent no less than $215 million for plastic dolls alone, and it appears that this figure will be topped in 1956.

Competition from Germany and Japan —though increasing—doesn't seem to be a major threat now. In 1955, Germany exported $7.5 million worth of dolls to U.S. That country is boosting its output in such items, but price differentials are expected to operate in favor of U.S. manufacturers.

BUSINESS INDICATORS

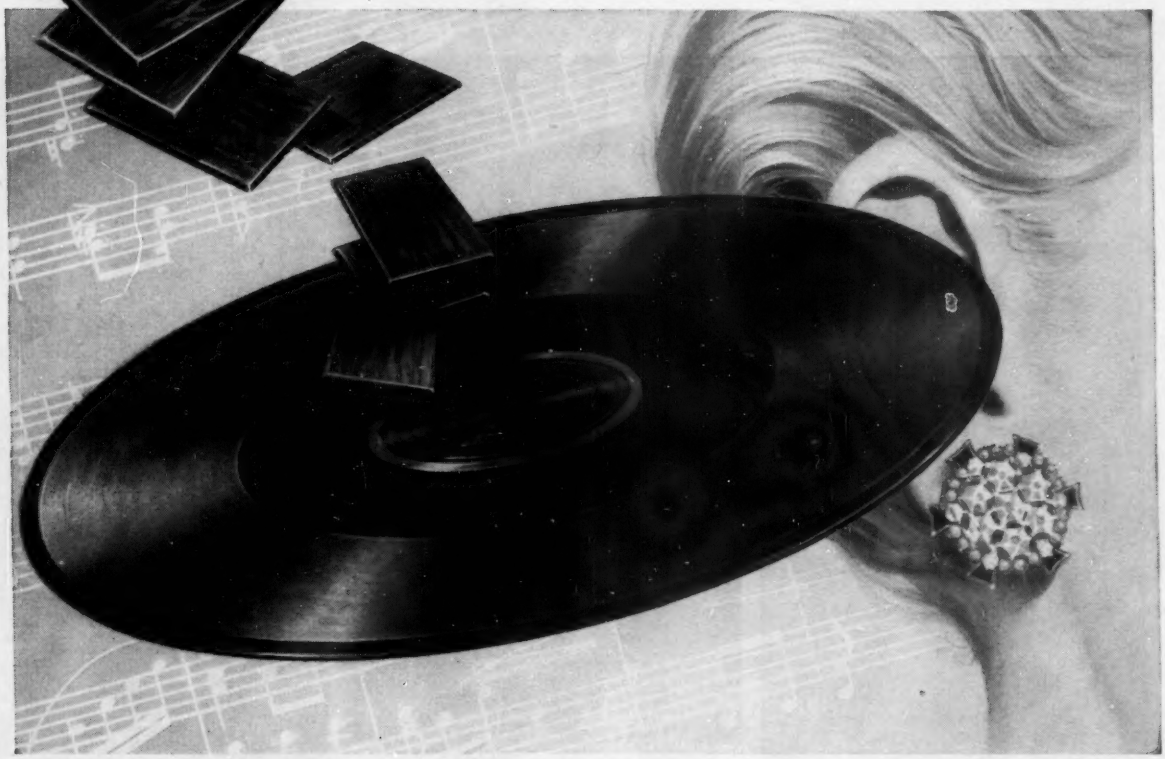


WEEKLY	Latest Week	Preceding Week	Year Ago
Chemical Week Output Index (1947-49=100)	182.5	182.0	161.5
Chemical Week Wholesale Price Index (1947=100)	105.6	105.6	104.0
Stock Price Index of 11 Chemical Companies (Standard & Poor's Corp.)	485.2	478.2	363.4

MONTHLY—Foreign Trade (Million Dollars)	Exports			Imports		
	Latest Month	Preceding Month	Year Ago	Latest Month	Preceding Month	Year Ago
Chemicals, total	97.1	93.0	86.0	21.6	21.3	20.6
Coal tar products	5.5	6.0	7.5	4.4	4.1	3.9
Industrial chemicals	14.7	14.0	12.5	7.0	7.0	5.1

EXON: each resin engineered for a specific problem

EXON 480 records



High tonal quality and exceptional resistance to breakage are assured when you make "biscuits" with EXON 480.

This Firestone resin provides unique production advantages in the blending, fusing, preforming and molding processes. Its higher bulking density speeds up banbury output as much as 25%.

EXON 480 offers high thermoplasticity, good heat and light stability, and is entirely compatible with the vinyl plasticizers, stabilizers and pigments recordmakers most often use.

Continuing Firestone research aids industry by creating such specific resins for specific needs. Whatever your problem, the answer may well lie in this ever-growing line of EXON resins.

Firestone

EXON®

For complete information or technical service on any EXON *resin, call or write today:*

CHEMICAL SALES DIVISION

FIRESTONE PLASTICS COMPANY, POTTSTOWN, PA., DEPT. 64E

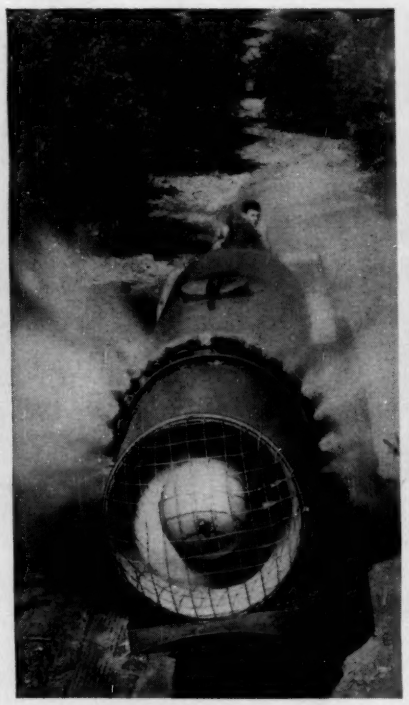
A DIVISION OF THE FIRESTONE TIRE & RUBBER COMPANY

WITCO CHEMICALS AT WORK

Bigger crops...tougher tires...clearer vinyls...

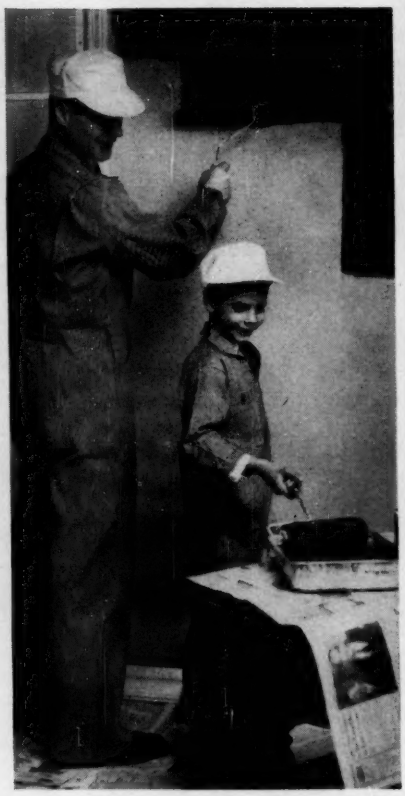
LOOSENING IMBEDDED GRIME

—a quick and efficient operation with Ultra's Neopone LO, a low-foaming detergent especially designed for tumbler or agitator type automatic washers. Ultra Chemical supplies a complete line of detergent liquids, flakes and beads from one source. *Ultra Chemical Works, Inc., Paterson, N. J.*



CROP YIELDS ARE CONSTANTLY EXPANDING

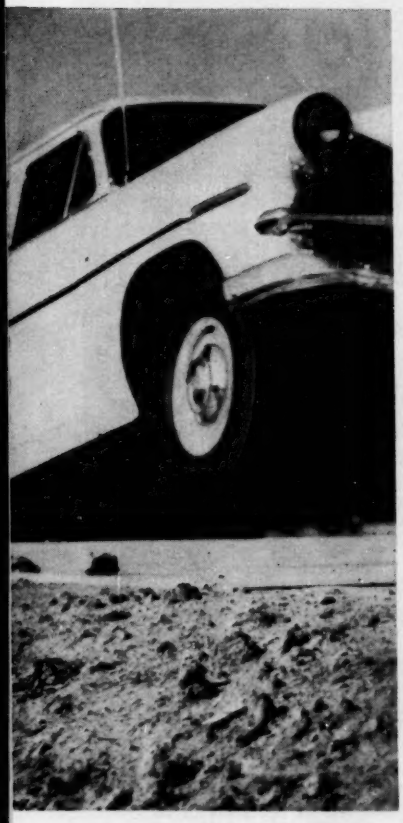
through better protection against insects and weeds...a result of increased efficiency in pesticide sprays formulated with EMULSOL emulsifiers. *Emulsol Chemical Corporation, Chicago, Ill.*



WHAT A DIFFERENCE SOME PAINT MAKES.

Improved suspension of pigments in paints is one of the many applications of WITCO Stearates. These metallic soaps have many properties which make them exceedingly useful in a wide variety of industries. They impart flatness to varnish and lacquer films, internal lubrication of plastic masses, heat and light stabilization of vinyl compositions, and impart water repellency to fabrics, concrete, bricks, etc.

through Witco's accent on quality and service



INCREASED TEAR AND ABRASION RESISTANCE

in many of today's top-quality automobile tires is achieved through the use of specially developed WITCO-CONTINENTAL reinforcing carbon blacks. *Continental Carbon Company, New York, N. Y.*

COME RAIN OR SHINE.

Vinyls formulated with WITCO STAYRITES® keep their color when exposed to heat or light over extended periods. Witco produces a variety of STAYRITES for the proper stabilization of Vinyl resins.

Witco chemicals are busy at work in many fields... helping to improve products, increase processing efficiency and provide solutions to production problems.

Behind Witco's service in industry are 36 years of steady growth... a story of constantly expanding research and production facilities.

Witco produces a large number of *quality* chemicals for many industries.

For additional information on these or other Witco products, write today.

36 Years of Growth

WITCO

Associated Companies:

ULTRA Chemical WORKS

CONTINENTAL BLACKS

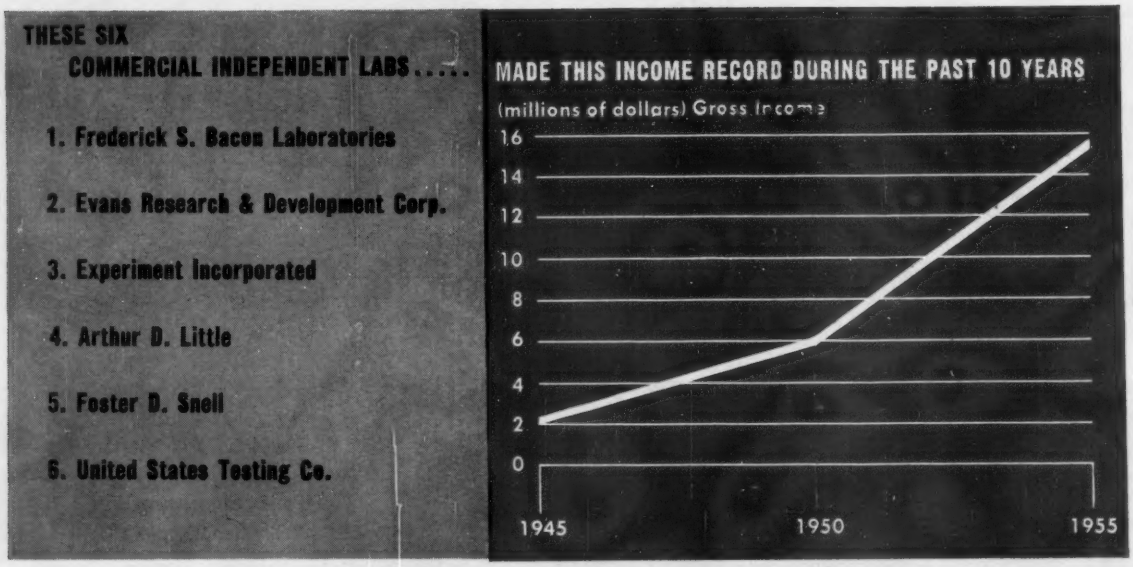
Emulsol

WITCO CHEMICAL COMPANY

122 EAST 42ND STREET, NEW YORK 17, N.Y.

Chicago • Akron • Boston • Atlanta • Houston • Los Angeles • San Francisco • London and Manchester, England

14 Manufacturing Plants — 5 Research and Service Laboratories



Ahead: More Good Years for Commercials

As the cost of doing research increases—and it has been increasing steadily—more and more work is being farmed out by chemical companies. One body of opinion holds that independent research organizations will eventually annex most functions of their "captive" kin—company research departments.

The latter, it is felt, will survive only to the extent that they can match the costs and services of the highly specialized independents. Lending statistical credence to this view is the independents' rapid rate of gain in the past five years†—far exceeding the 20% annual climb in over-all chemical research spending.

Last week, with the bulk of '55 figures in, *CW* surveyed commercial independent laboratories* to determine whether the trend is holding up, and why. Findings: gross incomes are at a record high; commonplace are gains of 30% over last year.

The larger firms—six of which are represented in the chart—have registered the greatest income growth. Other important gainers include Colburn Laboratories (Chicago), Food Research Laboratories (New York) and Truesdail Laboratories (Los Angeles).

In general, a company turns to an outside laboratory:

- When a project doesn't justify an investment in additional staff and equipment.
- To get a fast start on new projects, without interrupting current research.
- To get a fresh point of view on a project or field of work.

Getting down to cases, American Viscose says it has found independents useful in exploratory research (e.g., finding applications for new products), expects to farm out more such work.

Olin Mathieson calls upon them for studies requiring very specialized facilities and experience. OM does not foresee an increase in the proportion of research it gives to outside agencies, although it will be contracting for a greater volume of work as its total research program expands.

American Chicle Co. (Long Island City, N. Y.), which recently upped the amount of its contract research from 50 to 75%, particularly favors the speed with which commercial labs have produced answers to its problems.

Both Standard Oil (N. J.) and Du Pont also have relied upon commercial labs for special projects; neither reports an intent to boost the proportion of work it farms out to these organizations.

Not Sold: American Cyanamid and Union Carbide are among those that are not sold on commercial labs. Cyanamid seldom* uses independents, especially for product research. Carbide does its own development work, uses nonprofit institutes for long-range research.

Commercial laboratories, while generally pleased with business prospects, aren't uniformly optimistic. U.S. Testing takes what is perhaps the brightest view, expects to double its gross income in the next three years.

On the other hand, Anderson Physical Laboratories (Champaign, Ill.) sees big companies doing more of their own research, depending less on outside assistance. Moreover, it avers, more small companies, too, are building their own laboratories—not only to expand research but also to look progressive, woo stockholders.

But Colburn Laboratories, for ex-

†From $2.2 billion (including government research) to an estimated $4.5 billion in 1955.

*Which are a group apart from independent, nonprofit institutes, e.g., Battelle Memorial Institute, etc.

*Occasion when it did was after Boston's Coconut Grove fire. Cyanamid employed Foster D. Snell to check toxicity of fumes from burning melamine to scotch rumors that burning melamine-topped tables and chairs gave off hydrogen cyanide gas.

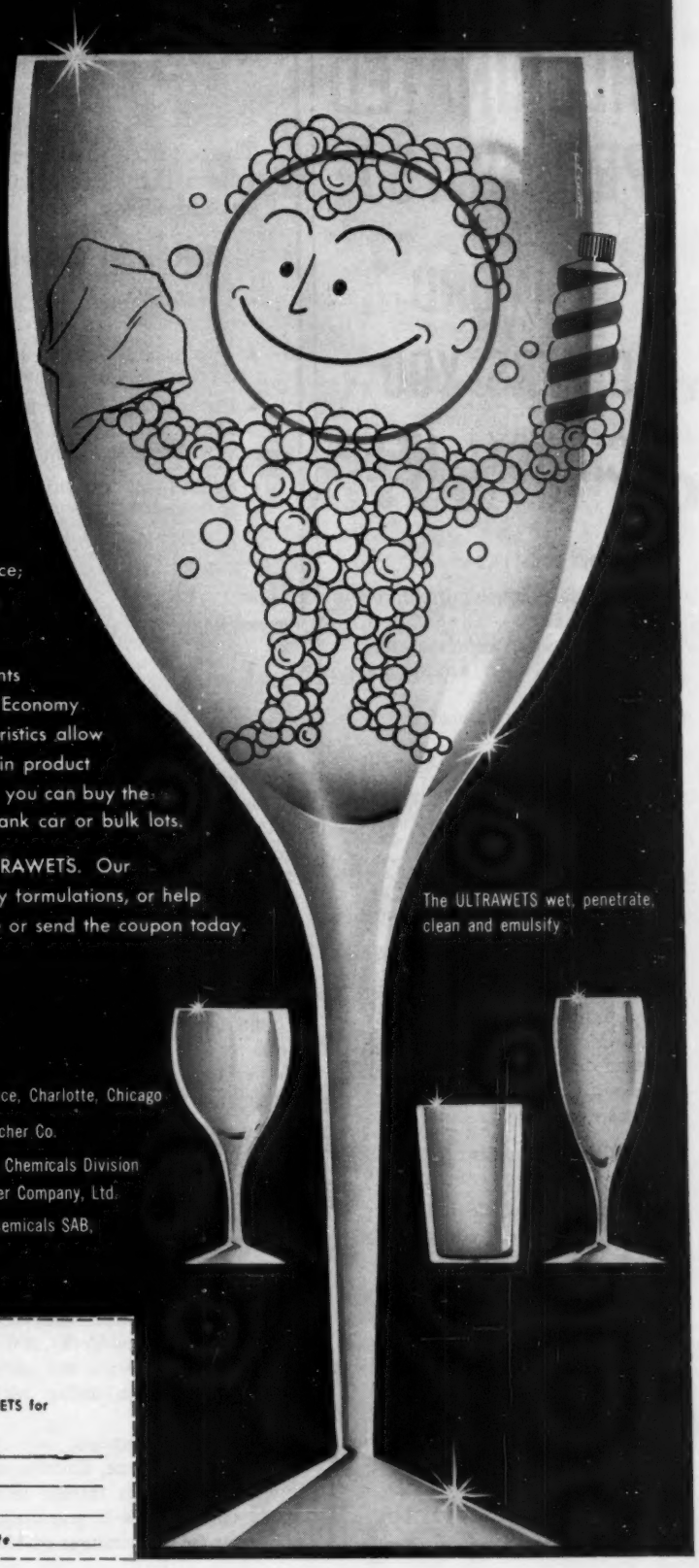
Suds Shines and SELLS

The growing preference for liquid detergent formulations is showing up in the sales picture . . . last year there was a phenomenal industry-wide increase in these sales.

And no wonder . . . liquid detergent formulations offer real economy; instant solubility in any water; a pleasing fragrance; sneeze-free washing; dishes that dry shining bright; no sink scum to scrub away.

Many of today's best-selling liquid detergents are formulated with Atlantic ULTRAWETS. Economy is one reason. High performance characteristics allow a saving on the quantity needed to maintain product efficiency. Add to this saving a further one: you can buy the ULTRAWETS at significantly low prices in tank car or bulk lots.

Ask us for detailed information on the ULTRAWETS. Our Chemical Products Sales Division can supply formulations, or help you develop your own. Write, wire, phone or send the coupon today.



The ULTRAWETS wet, penetrate, clean and emulsify

ATLANTIC PETROLEUM CHEMICALS

Philadelphia, Providence, Charlotte, Chicago

In the West: L. H. Butcher Co.

In Canada: Naugatuck Chemicals Division of Dominion Rubber Company, Ltd.

In Europe: Atlantic Chemicals SAB, Antwerp, Belgium

THE ATLANTIC REFINING COMPANY
Dept. H-12, Chemical Products Sales
260 South Broad Street, Philadelphia 1, Pa.

Please send me information on the ULTRAWETS for liquid detergent formulations.

Name_____

Firm _____

Street _____

City_____ Zone _____ State _____

CHLORINATED PRODUCTS?

DIAMOND OFFERS YOU TECHNICAL HELP

If you need assistance

on a problem involving chlorinated products, phone your nearby DIAMOND representative. His service is expert, prompt and free.

Diamond

makes the following products at Newark, N. J. We'll ship 'em immediately.

Chloral
2, 4-Dichlorophenol
2, 4, 5-Trichlorophenol
2, 4, 6-Trichlorophenol
Hexachlorobenzene

Maybe you're interested

in custom production of benzene sulfonyl chlorides, or their chlorinated derivatives. Your nearby DIAMOND man will be glad to discuss this with you.

More Diamond products:

carbon tetrachloride; perchlorethylene; methylene chloride; methyl chloride; chloroform; Chlorowax® (chlorinated paraffin); muriatic acid; DDT; BHC, 15% and 40% gamma; Lindane; 2,4-D and 2,4,5-T amine salts, esters and formulations; grain fumigants. DIAMOND ALKALI COMPANY, 300 Union Commerce Building, Cleveland 14, Ohio.

Diamond Chemicals

What's Ahead for Commercial Labs

These are the areas in which they are strongest, should show . . .

Greatest Growth

- Development of products, processes and equipment.
- Application studies, especially detailed evaluation work.
- Exploratory research — i.e., determining potential of a new line of products.
- Setting up quality - control systems.
- Applications of operations research.

Here's where they don't usually fit in, will probably register . . .

Little Gain

- Pilot-plant studies and engineering development work.
- Long-range research. Most companies find universities and nonprofit institutes better for these projects.
- Fundamental research. Here, too, independent commercial laboratories probably will never seriously compete with colleges, universities and research institutes.

ample, feels a small company's contract with an independent is just as solid evidence of the former's research progress as capital investment in a new laboratory.

Moot Point: Perhaps the most realistic forecast is that the independent commercial labs are destined to make further substantial gains in those areas in which they have most to offer (*see table, above*). Whether all this adds up to progressively greater dependence on the commercial labs is far from certain.

But based on the expected rise in research spending in the next decade, the independents continue to be in for continued prosperity.

Metal Winnower

Metallurgical circles are buzzing this week over a new technique of prying strategic metals (manganese, uranium, beryllium, lithium, etc.) from ordinarily hard-to-process ores. Developed by Samuel Korman of Sheer-Korman Associates Inc. (New York), it utilizes a high-intensity electric arc, climaxes studies by Korman dating back to 1938.

In Korman's process, ore (e.g., rhodonite, spodumene, ilmenite, euxenite, beryl, etc.) is formed into an anode (the cathode is graphite), vaporizes under temperatures of 13,000-18,000 F produced by a high-intensity electrical discharge.

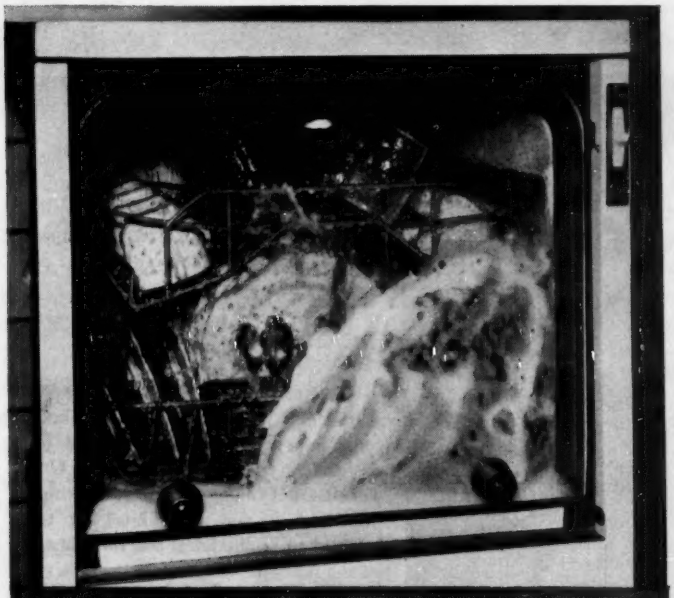
The vapor consists of a mixture of metallic oxides, which are collected, converted into metals.

While the actual chemical method varies with the metal to be recovered, it consists essentially of leaching out the desired metal with an electrolyte, then electrolyzing the resulting solution of metal salt. For example, manganese and silicon oxides, which are chemically combined in the ore, are deposited as physically mixed oxides after vaporization in the electric arc. Treatment with sulfuric acid results in a solution of manganous sulfate (the silicon oxide is not dissolved), which yields manganese on electrolysis.

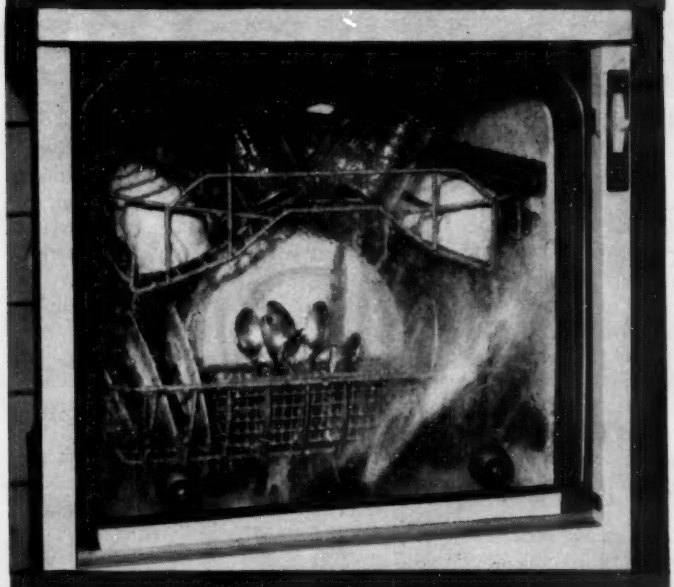
Or the vapor can be ionized, and the metals separated by the mass-spectrometer principle.

Prime targets for any future commercial applications of the process will be the array of domestic ores that now defy economical removal of their rich metal content.

Rhodonite ($MnO.SiO_2$), for example, contains 35% manganese which is so tightly bound as to make its chemical recovery impractical. Steelmakers who now import manganese from Asia and South America may find the new approach worthy of a closer look.



Conventional low-foam Detergent
Notice excessive foam 3 minutes after beginning of wash cycle.



TRITON CF-10
Notice how suds are controlled (after same length of time) for better dishwasher operation.

End Excessive Foam with High-Detergency TRITON CF-10

Detergents containing TRITON CF-10 do not foam excessively even when violently agitated. The result is that automatic dishwashers can do their job better, and kitchenware rinses clean without streaks or spots. At the same time, TRITON CF-10 has such excellent detergent properties that it effectively removes soil from the hardest-to-clean plastic ware. Investigate TRITON CF-10 for your cleaning compounds today.

TRITON is a trade-mark, Reg. U.S. Pat. Off. and in principal foreign countries.

Chemicals for Industry

ROHM & HAAS COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

Representatives in principal foreign countries

CHEMSTRAND'S SODAY: In the booming South, a dearth of research.

Warning from the South

The chemical industry's march to the South shows few signs of slowing. The region* now is said to contain one-third of the industry, expects to boost this to one-half in the next decade, have most of it by 1975. But even the South's most enthusiastic proponents confess their concern over the lag in relocating the research needed to support production.

Among those who fit the above description is Chemstrand's (Decatur, Ala.) Frank Soday** who has turned up some new statistics on Southern research. His conclusions: the South's need for more researchers and more research facilities is pressing.

A survey of Southern schools, recently made by the Southern Regional Education Board, shows that the area is not self-supporting in chemically trained manpower at any level of education, exports a considerable number of its potential researchers as graduate students to universities in other states. Southern-school Ph.D. chemistry graduates comprised 13% of U.S. total in 1953.

What's more, Soday avers, Southern schools do not support research commensurate with industrial needs of the area.

"In the field of industrial research," he declares, "it is also disconcerting to find that the South accounts for only 4% of the industrial research under way in this country."

The future, however, is brighter. He predicts that new research facilities will be forthcoming at a rapid rate. "Over 100 new research laboratories, or major additions thereto, were constructed in 1952, and 40 consulting research units have been established in the region in the last decade," he says.

"It is predicted that at least 1,000 new industrial research laboratories will be constructed in the South in the next ten years, and that 15,000 scientists and engineers will be required to operate the new facilities thus provided."

Considering that the South built $710 million worth of new chemical plants in 1954, and another $780 million worth are on the way, the hoped-for research expansion cannot—in Soday's opinion—arrive too soon.

*The ten tidewater states from Maryland to Texas and West Virginia, Kentucky, Tennessee, Arkansas, and Oklahoma.

**Vice-president, research and development; president of Southern Association of Science and Industry; member Southern Regional Education Board, etc.

Ozone Suppressers

Despite years of effort, no chemical maker has yet come up with a wholly satisfactory agent to stop ozone deterioration of rubber. Last week, Universal Oil Products Co. (Des Plaines, Ill.) had a new candidate out for evaluation in the latest bid for a share of the potential antiozidant market, set at a whacking $50-75 million.

Right now, all the firm will reveal is that the new product—UOP 288—is an isomer of its recently released antiozidant, UOP 88 (believed to be N, N'-di-octyl-*p*-phenylenediamine). The two compounds are rated equal in antiozidant effectiveness; the difference is that one allows a faster cure during rubber compounding.

UOP is putting finishing touches on a new plant to produce both products, will soon offer commercial quantities.

Two other companies are known to have similar materials out for evaluation. Burke Research Laboratories (Detroit) has done much work in this field, is now supplying drum quantities of two products called Ozo 88 and Ozo 8835.

How or Whether: Burke declines to identify its compounds, says only that it has filed for patents on them. How the Burke and UOP compounds differ—or whether they differ at all—is anyone's guess. A Burke spokesman, when queried on this point, replied: "We have filed for patents, UOP has filed for patents. Draw your own conclusions."

Under a licensing agreement with Burke, Eastman Chemicals (Kingsport, Tenn.) has been offering Tenamene 30 and Tenamene 31, identified as "alkyl substituted phenylenediamines." Eastman says that, although it has been shipping the Tenamenes in commercial quantities for several months, it feels the newcomers are still in an evaluation stage, refuses to make any claims beyond "early results are encouraging."

Attack Under Stress: Atmospheric

Saves 90% of Operator's Time

Batch equipment was replaced by Bird Continuous Centrifugal Filters for separating and washing salt crystals from glycerine solutions. Using about 0.4 lb. wash water per lb. of salt, the Bird discharges crystals containing less than 0.3% glycerine. Moisture content is about 4%. The operator, formerly required full time, can now devote more than 90% of his time to other duties.

Eliminates Heavy Loss of Valuable Product

When polyvinyl chloride resin was dewatered in decantation tanks, as much as 3 to 4% of the solids was lost to the sewer in the fines. Now with a Bird Continuous Centrifugal Filter on the job, this loss is entirely eliminated. The Bird has been almost universally accepted for synthetic resins because operation is completely under cover — no dust or dirt can contaminate the product.

One BIRD Handles Many Jobs

In the process of recovering food flavoring oils from spices, one small Bird is used to separate spent solids from liquids. This single machine does a uniformly good job on a wide variety of solids, and switches from one product to another easily and quickly. It handles a few hundred pounds of half a dozen different materials per day and does it at low cost.

Runs for 10 years with only one Minor Repair

A Bird Filter handling a crystalline product has been operating for ten years without any mechanical failure or parts replacements except for one conveyor that needed resurfacing after six years of operation. Another Bird originally installed to meet wartime emergency demands for chemicals used in explosives was dismantled and checked twelve years ago to make sure its strenuous service had done it no harm. It was in excellent shape and has continued to run ever since without mechanical overhaul or parts replacements.

BIRD Continuous Centrifugal Filters

Birds are busy in hundreds of plants helping to make better products and more of them per day at lower cost per ton.

Whether your filtering operation is large or small, with solids fine or coarse, feeds thick or thin, hot or cold, it will pay you to find out what this Bird can do.

Hundreds of applications like these emanated from pilot scale tests made at the Bird Research and Development Center. These same test facilities are available to you for providing the answers to your filtration problems promptly and dependably *in advance* of your investment.

BIRD

Leading Authority on Solids-Liquids Separations

Builders of
- Bird Continuous Centrifugal Filters
- Bird-Prayon Continuous, Rotary, Horizontal Vacuum Filters
- Bird-Young Continuous Rotary Vacuum Filters
- Bird Horizontal Tank, Vertical Leaf Pressure Filters
- Bird-Humboldt Screen Type Centrifugal Dryers
- Bird Suspended Centrifugals • Bird Centrifugal Classifiers
- Bird Continuous Centrifugal Coal Filters • Bird Polishers
- Bird Centrisweeps for delicate Crystals, Fibrous Materials

For specific information on individual machines write Bird Machine Company, South Walpole, Massachusetts
Regional Offices: Evanston, Illinois • Portland, Oregon

Research Will!

Jacques Wolf Research Laboratories Provide Greater Efficiency in Chemical Processing

No, wishing for better products won't make them a reality. Research is the stuff that such dreams are made of. Jacques Wolf & Co. has a complete line of chemical auxiliaries, designed specifically for better performance, that are kept up-to-date through constant research. These products provide greater efficiency in manufacturing and processing in leather, food, textile, brewery, lithographic, pharmaceutical, cosmetic and allied industries.

We would like the opportunity of submitting samples of these auxiliary products to you. Call on us today!

A complete line of: Natural Vegetable Gums, Reducing Agents, Emulsifiers, Dispersing Agents, Amylolytic and Proteolytic Enzymes, Detergents, Wetting Agents, Synthetic Tanning Materials, Sulphonated Oils and Textile Auxiliaries.

JACQUES WOLF & CO.
Chemicals PASSAIC, N.J.

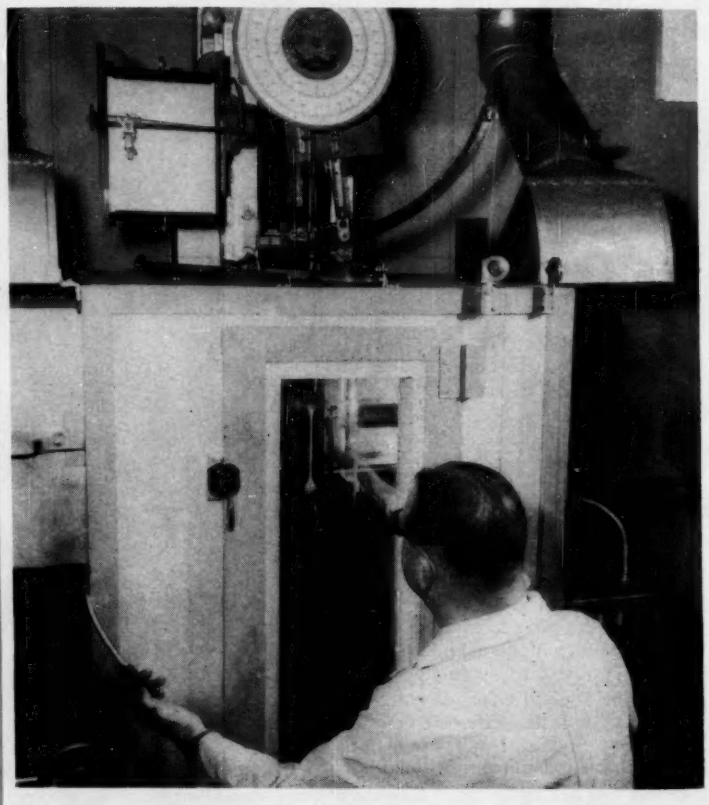
Plants in: Clifton, N.J., Carlstadt, N.J., Los Angeles, Calif.

ozone is believed to be the main factor in causing stressed rubber to crack. The service life of tires, hose, gaskets and other rubber goods is considerably shortened by ozone attack. Thousands of dollars worth of military equipment, for example, is lost every year because of ozone.

This problem has become more acute with increased use of GR-S rubber and oil-extended GR-S. Although natural rubber is just as susceptible to ozone attack, it doesn't crack as severely as GR-S.

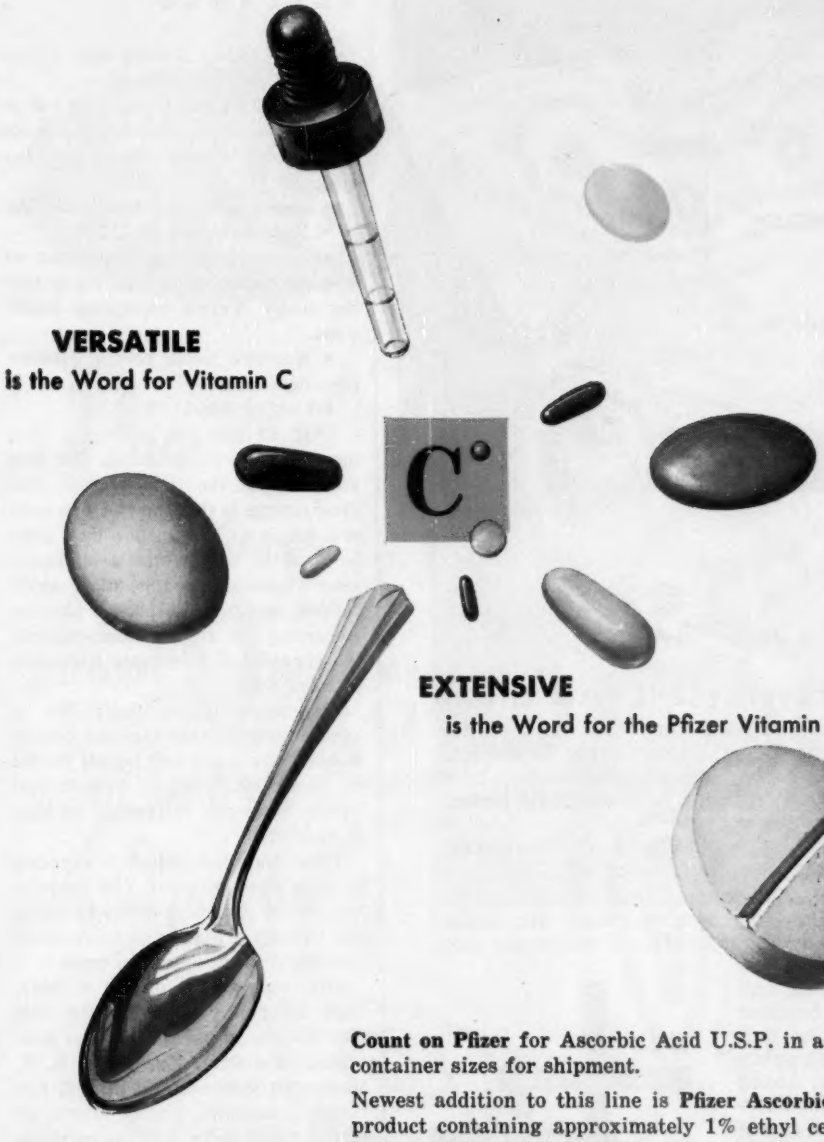
Several methods have been devised to combat ozone attack, but none has proved to be the final answer. One approach is to use waxes that migrate to the surface, form a protective film on the rubber. This, however, is not effective on rubber that is flexed (e.g., tires). Reason: the film ruptures, letting ozone through. Protective coatings have been used for nondynamic protection, but they are costly, must be applied frequently.

Right Combination: The best way known to make GR-S products ozone-resistant is to incorporate an ozone inhibitor in the rubber compound. Finding commercially acceptable inhibitors has been a problem, for aside



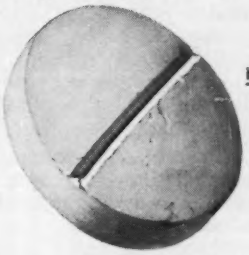
Warm-up for New Synthetics

HEAT-RESISTANT synthetic rubbers aspiring to commercial application will come up against this new testing apparatus designed by Firestone Tire & Rubber Co. (Akron, O.) researchers. It features accurate temperature control up to 1,000 F, houses a strength and elasticity testing machine. Present published data on rubbers covers temperatures up to 400 F. But new rubbers are aiming for even hotter applications (for example, in jet aircraft).



VERSATILE
is the Word for Vitamin C

EXTENSIVE
is the Word for the Pfizer Vitamin C Line!



New Pfizer Ascorbic Acid, Coated, gives you better tableting, offers interesting possibilities. (See below)

Count on Pfizer for Ascorbic Acid U.S.P. in a wide range of granulations—and container sizes for shipment.

Newest addition to this line is **Pfizer Ascorbic Acid, Coated** (a white granular product containing approximately 1% ethyl cellulose as the coating agent). Its improved characteristics offer you interesting application potentialities for high potency ascorbic acid tablets and troublesome combinations. Consider it, too, for anti-cold preparations.

Pfizer Ascorbic Acid Micro-Powder...another Pfizer "C"...offers you a product so fine it will pass through a 325 screen. **Pfizer Sodium Ascorbate** is a non-acidic form of Vitamin C particularly useful in chewable tablets. **Pfizer Ascorbyl Palmitate,** a more fat-soluble antioxidant, retards development of rancidity in oily or fatty pharmaceutical and cosmetic preparations. **Pfizer Calcium Ascorbate** with its high Vitamin C activity is offered for manufacturers requiring the combination of Vitamin C and calcium in their formulations.

Count on Pfizer Technical Service for full counsel on the handling and application of these and other products. For samples and further information contact Pfizer now.

Pioneers and Leading Manufacturers of Vitamins **Pfizer**

CHAS. PFIZER & CO., INC.
Chemical Sales Division
630 Flushing Ave., Brooklyn 6, N. Y.
Branch Offices: Chicago, Ill.; San Francisco, Calif.; Vernon, Calif.; Atlanta, Ga.; Dallas, Texas.

you can
CUT COSTS—
PROTECT PRODUCTS
BETTER—with

Durethene POLYETHYLENE FILM LINERS

It's amazing how you can cut into packaging costs when you use Polyethylene Film to line your drums, bags or boxes. In shipping weights alone, savings can be hefty. Then, you're setting up a big barrier against spoilage and waste — because Polyethylene keeps contents *in*, no matter how active or volatile . . . bars intruding contamination *out* . . . is inert to almost all widely used chemicals, so there's no container-product reaction to fear.

The *kind* of Film is important, of course. That's the reason so many well-known products travel in containers lined with DURETHENE Polyethylene Film — the *strongest* Film you can get. And DURETHENE specializes in helping packagers solve hard problems; call us in to check on what can be done to give *you* greater protection and reduced packaging and shipping costs. Right now, send for our useful "Application Bulletin", covering Polyethylene use with hundreds of chemicals. And when you buy liners, ask your converter for DURETHENE . . .

THE POLYETHYLENE FILM WITH THE "DOUBLE-PLUS" QUALITY

Durethene CORPORATION
Manufacturers of Polyethylene Film for Converters
1859 SO. 55th AVENUE . . . CHICAGO 50, ILLINOIS
6601 W. ARBOR VITAE ST. . . . LOS ANGELES 45, CALIF.
New York Office: 175 FIFTH AVENUE, NEW YORK CITY 10

Please send free copy of your *POLYETHYLENE APPLICATION GUIDE*, and samples made from DURETHENE Film. We are now packaging in Polyethylene:
_____ We plan to package in Polyethylene:
_____ CW
Signed _____
Company _____
St. & No. _____ City _____ State _____

RESEARCH. . . . . .

from antiozidant activity they should ideally have these properties:

- Solubility in rubber. This allows the compound to continually migrate to surface. (Ozone attacks only at surface.)
- Nonstaining and nondiscoloring.
- Heat resistance to 212 F.
- Low enough vapor pressure so that the compound is retained in rubber under normal processing conditions.
- Nontoxic under normal processing conditions.
- Cost of 50¢-$1/lb.

UOP 88 and 288 reportedly meet most of these requirements. But they are still not the final answer. One disadvantage is that they tend to stain and discolor. This means they can't be used in refrigerator door liners, auto windshields, among other applications. Another drawback is toxicity. According to rubber compounders, the phenylenediamines are hazardous to work with.

Too, compounders don't like to handle them because they are liquids. Rubber processors find liquids harder to handle than solids, believe that liquids are more susceptible to handling losses.

Final drawback (which is expected to be overcome) is cost. The products are on the expensive side—$1.50/lb. But Universal, Burke and Eastman all say they're working to cut costs.

With such a huge market at stake, these companies won't be the only ones striving to turn up a better antiozidant. Du Pont, Naugatuck, R. T. Vanderbilt, American Cyanamid, and rubber companies, among others, all report: "Sure we're working on them; who isn't?" The government is also keenly interested, has sponsored considerable antiozidant research at Rock Island Arsenal (Rock Island, Ill.).

With the ideal still considerably beyond reach, there is still room for others, too.

EXPANSION. . . .

These companies report new research construction:

- Sun Oil Co. plans to relocate its present Norwood, Pa., laboratory in a new $1.37-million addition to its Marcus Hook, Pa., research center. Completion of construction is scheduled for 1957.
- Colgate-Palmolive will build a

Watch your P's and Q's

Pure stearates guard Quality of baby's powder...

Even trace impurities could irritate his tender skin—no wonder so many baby powders are made with pure Metasap stearates . . . dependably the cleanest stearates made!

This trusted purity helps guard product quality in many other industries too — in textiles, foods, recordings, greases — where even a few tiny specks of foreign material might harm the reputation and performance of the product.

For at Metasap, our primary aim is to turn out the cleanest stearates made anywhere in the world! Fine modern equipment is backed up at Metasap by the most thorough series of fine screens, magnetic traps and filters to be found in the industry. (We even carefully filter the air.) So depend on this — for stearates of supreme uniformity and quality, come to Metasap. Our technical service department will gladly advise and assist you.

Some industries served by Metasap

PAINT *makers solve pigment suspension problems with Metasap Stearates, producing primers and sanding sealers that have excellent filling qualities.*

LACQUER AND VARNISH *makers use Metasap Stearates to assure efficient flatting, and to obtain better finishes.*

PLASTICS *molders use Metasap Calcium, Zinc, and Barium Stearates to improve internal lubrication, which assures superior preforms, better finished products, and longer mold life.*

RUBBER *processors use Metasap Zinc and Magnesium Stearates to lubricate molds and prevent uncured stock from sticking.*

LUBRICANTS—*Grease makers use Metasap Stearates because these outstanding soaps afford a wide range of quality bases that help producers to meet any grease specifications.*

PAPER, *Textiles, Cosmetics, Food Processing, Pharmaceuticals, and many other industries call upon Metasap Stearates to perform important services.*

METASAP CHEMICAL COMPANY

HARRISON, NEW JERSEY • Chicago, Ill.
Boston, Mass. • Cedartown, Ga. • Richmond, Calif.

A NOPCO Subsidiary

the cleanest stearates made

TANTALUM... If you don't need it, you can't afford it. If you need it, you can't afford to do without it!

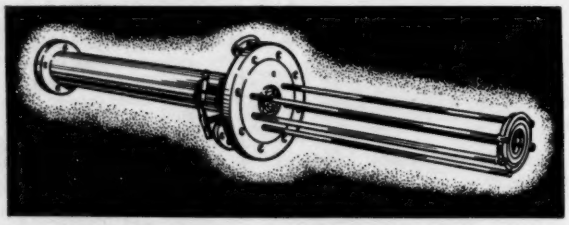
It is an easy matter to determine whether or not you need tantalum in your process. If tantalum eliminates shut-down, product contamination, side reactions, fume damage and other waste due to corrosion, *you need it!*

If tantalum increases equipment life four-fold, or more, even if it costs only twice as much...you need it!

Tantalum is immune (not merely resistant) to any of the following: hydrochloric acid, nitric acid, perchloric acid, bromine, iodine, hydrogen peroxide, chlorine, chlorine dioxide and many others. It is so slowly attacked by sulfuric acid that life may be measured in decades. It is strong, immune to thermal shock, unequalled in heat transfer efficiency.

Fansteel engineers can evaluate the pros and cons of tantalum very precisely as they apply to your process. From that point, it will be very easy for you to reach your own conclusions.

USE TANTALUM WITH ECONOMY for most acid solutions and corrosive gases or vapors, except HF, strong alkalis or substances containing free SO_3.



Write for free book, TANTALUM in Chemistry

FANSTEEL METALLURGICAL CORPORATION
NORTH CHICAGO, ILLINOIS, U.S.A.

G562A

RESEARCH . . . . .

multimillion-dollar research center on a 35-acre tract in Bloomfield, N. J., staff it with a personnel of 400.

• Nuclear Development Corp. of America (Pawling, N.Y.) has broken ground for a new radiochemical laboratory to study radiation effects on nuclear reactor fuel elements and structural materials.

• Monsanto is building a decorative and industrial laminating laboratory at its Springfield, Mass., research center, expects it to be in operation by late summer.

• St. Regis Paper Co.'s Panelyte Division has just opened its new thermoplastics laboratory at Richmond, Ind.

PRODUCTS . . . .

Reagents: Two new sulfur-containing organic reagents —2,4-dinitrobenzenesulfenyl chloride and 2,4-dinitrothiophenol— are available from Chemicals Procurement Co. (New York).

•

Temperature Gauge: For applications that demand standardized 100 F temperatures (e.g., studies concerning insulation, heating and cooling systems, etc.), Tempil Corp. (New York) is offering a new temperature-indicating pellet that melts at 100 F.

DRUGS . . . . . .

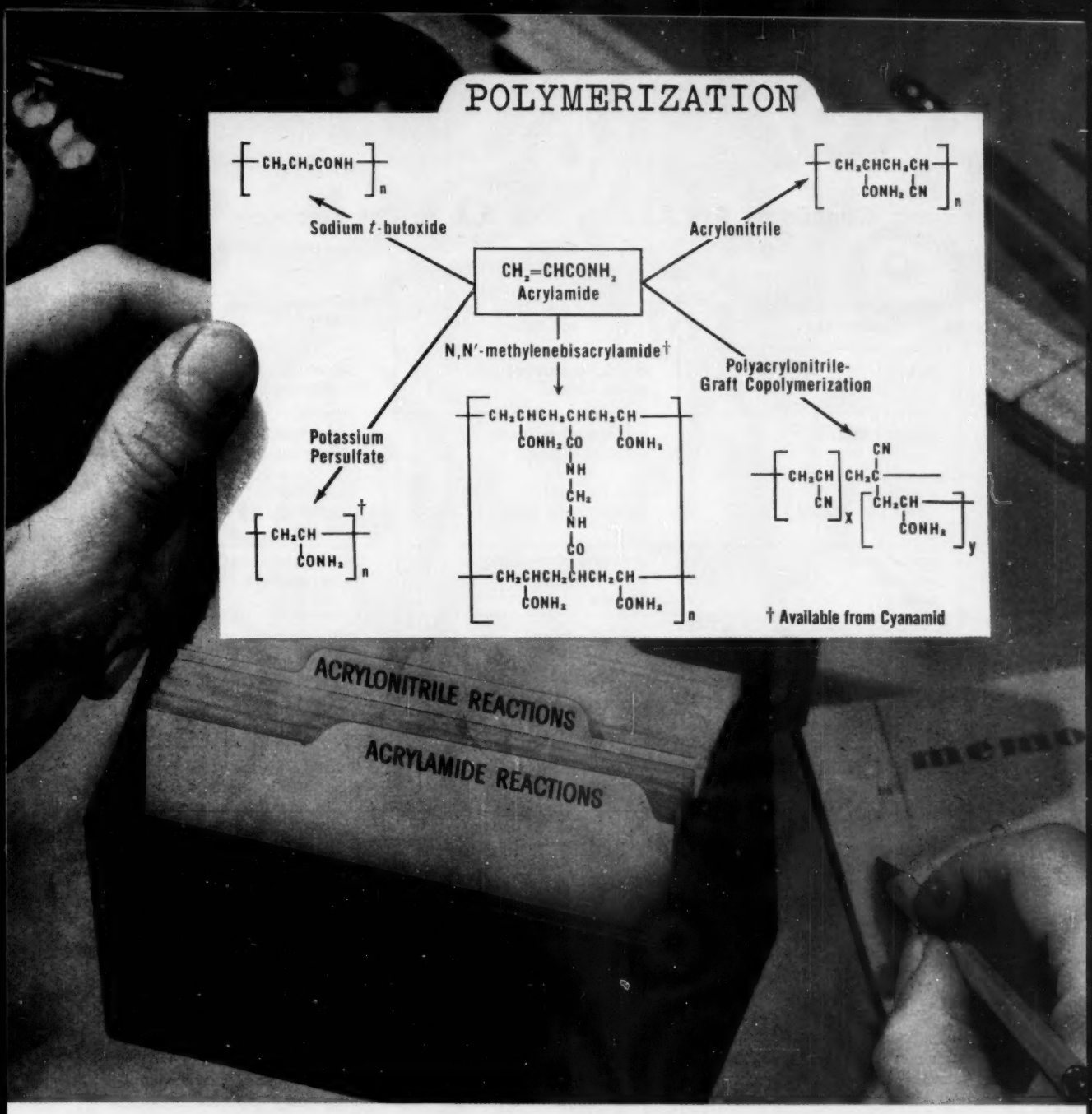
Cattle Cure: New drugs based on tetrazole have been synthesized at Michigan State University (East Lansing), are reportedly effective against antibiotic-resistant amoebic dysentery and trichomal diseases. One of the new compounds, chlorobenzyloctyliminotetrazoline, is claimed to control trichomonal disease in cattle.

•

Fungicide: A new nitrofuran derivative, 5-nitro-2-furfuryl-3-chlorpropionate inhibits the fungus *Coccidioides immitis* according to laboratory studies reported by Robert Cohen and Robert O'Connor at Kern General Hospital (Bakersfield, Calif.).

•

Virus Killer: Researchers at the University of Tokyo recently synthesized and studied the antiviral effects of 3-(alkylphenylazo)-4-hydroxy-1-naphthalenesulfonic acids. The sodium salt of the *p*-ethyl derivative was reportedly active *in vitro* against encephalitis virus.



Keeping Tabs on ACRYLAMIDE

Acrylamide will undergo vinyl polymerization readily. Aqueous solution polymerization produces polymers of varying water solubility depending on reaction conditions. Polymerizations in organic solvents usually yield low molecular weight polymers which are water soluble.

Polyacrylamide may be modified by hydrolysis, imidization, methylolation, and chlorination.

Acrylamide will copolymerize with many other vinyl monomers and imparts hydrophillic properties to the copolymers.

These polymers and copolymers of acrylamide have application in adhesives, dispersants, fibers, dyes, papers, photographic films, plasticizers, plastics, surface coatings, soil conditioners, and thickening agents.

The bulletin, "Chemistry of Acrylamide," contains references to more than 60 copolymers of acrylamide, in addition to suggesting many potential applications for them. Write for your copy today.

CYANAMID

AMERICAN CYANAMID COMPANY
Petrochemicals Department
30 Rockefeller Plaza
New York 20, New York

Note: The foregoing shall not be construed to imply the non-existence of any relevant patents nor to constitute a permission, inducement or recommendation to practice any invention covered by any patent owned by *American Cyanamid* or by others, without authority from the owner of the patent.

target

These Chemicals Are Already Standing in For Electrical Devices:

Material	Properties	Replaces
potassium sodium tartrate (Rochelle salt)	converts electrical signals into sound	electromagnetic microphone
nylon	conducts current when heated	bimetallic strip-contacts in electric blankets.
silicon carbide	current varies with applied voltage	electromechanical circuit breaker
phosphors (e.g., zinc sulfide)	give off light in an electrical field	incandescent and fluorescent light sources
germanium selenium silicon	converts alternating current to direct current	mechanical and vacuum-tube rectifiers
germanium, silicon	semi-conductors	multi-element vacuum tubes.
silicon	converts solar energy into electric power	batteries
aluminum-nickel-cobalt alloy	permanent magnet	loudspeaker electromagnets

Now, Electrical Device Manufacturers Would Like to Have . . .

Phosphors for Inside Lighting

Heir apparent to the multimillion-dollar household lighting mart, electroluminescent lamps must bide their time. Reason: these still largely experimental phosphor-containing plates (which generate light under alternating current) can't match the brilliance of their incandescent or fluorescent competition at household voltage (120 v.). But new phosphors could overcome this defect, set off what some believe would be a revolution in indoor lighting.

That's because electroluminescence, which can be made to emanate from areas (depending on the size of the plate), offers a better solution of structural lighting problems than do point-source (incandescent) or line-source (fluorescent) lighting. What's more, the light is more uniform in brightness and the plate is cool to the touch.

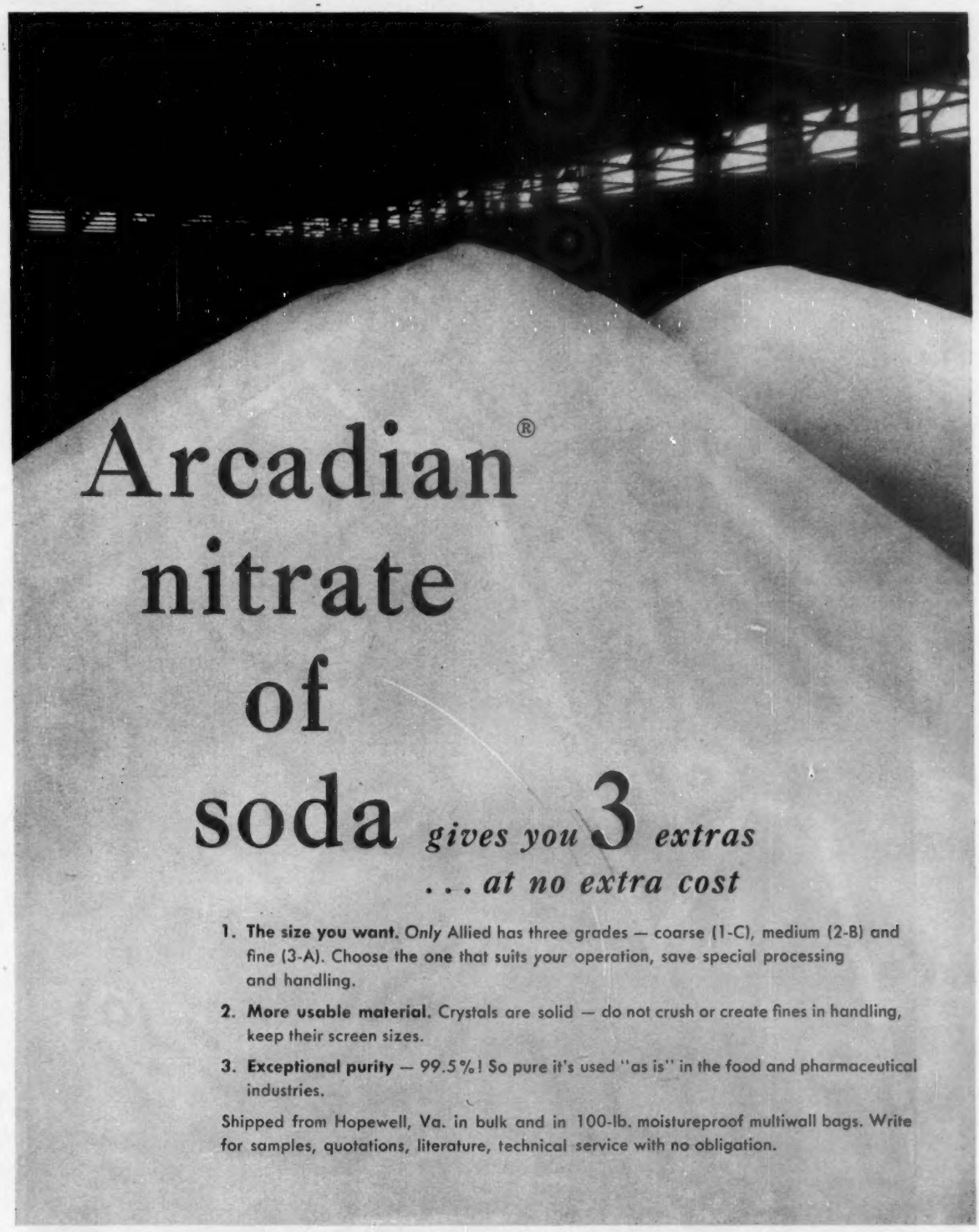
First on the scene (in 1950) with a commercial product of this kind, Sylvania Electric Products, Inc., is one of several electronic firms actively researching the problem. Sylvania uses zinc sulfide activated with copper, lead, or manganese—depending on the color required—as its phosphor for this purpose.

Recently, it developed a ceramic-phosphor version that features long life, adaptability to many shapes. But low light output restricts the newcomer's use to clock faces, signs, house markers.

Sylvania, like General Electric, RCA, Westinghouse and other electrical device makers, is looking for better ones. These firms prepare their own phosphors, are equipped to do the necessary chemical research. Chemical firms have a strong interest, too, as phosphor raw material suppliers. Du Pont, for example, supplied zinc sulfide (Cu), hexagonal, for recent electroluminescence studies at U.S. Naval Ordnance Laboratory (White Oak, Md.).

While the potential market for the right phosphor is conjectural, it's sure to be big. Reference points: fluorescent lamp and sign tubing phosphors worth $3.75 million were produced last year. During the same period, $4 million worth of phosphors went into black and white TV tubes.

Electronics firms feel their newest problem won't continue to defy solution, in view of the incentive, and trend toward functional materials (*see box*).



Arcadian® nitrate of soda *gives you* 3 *extras . . . at no extra cost*

1. **The size you want.** *Only* Allied has three grades — coarse (1-C), medium (2-B) and fine (3-A). Choose the one that suits *your* operation, save special processing and handling.
2. **More usable material.** Crystals are solid — do not crush or create fines in handling, keep their screen sizes.
3. **Exceptional purity** — 99.5%! So pure it's used "as is" in the food and pharmaceutical industries.

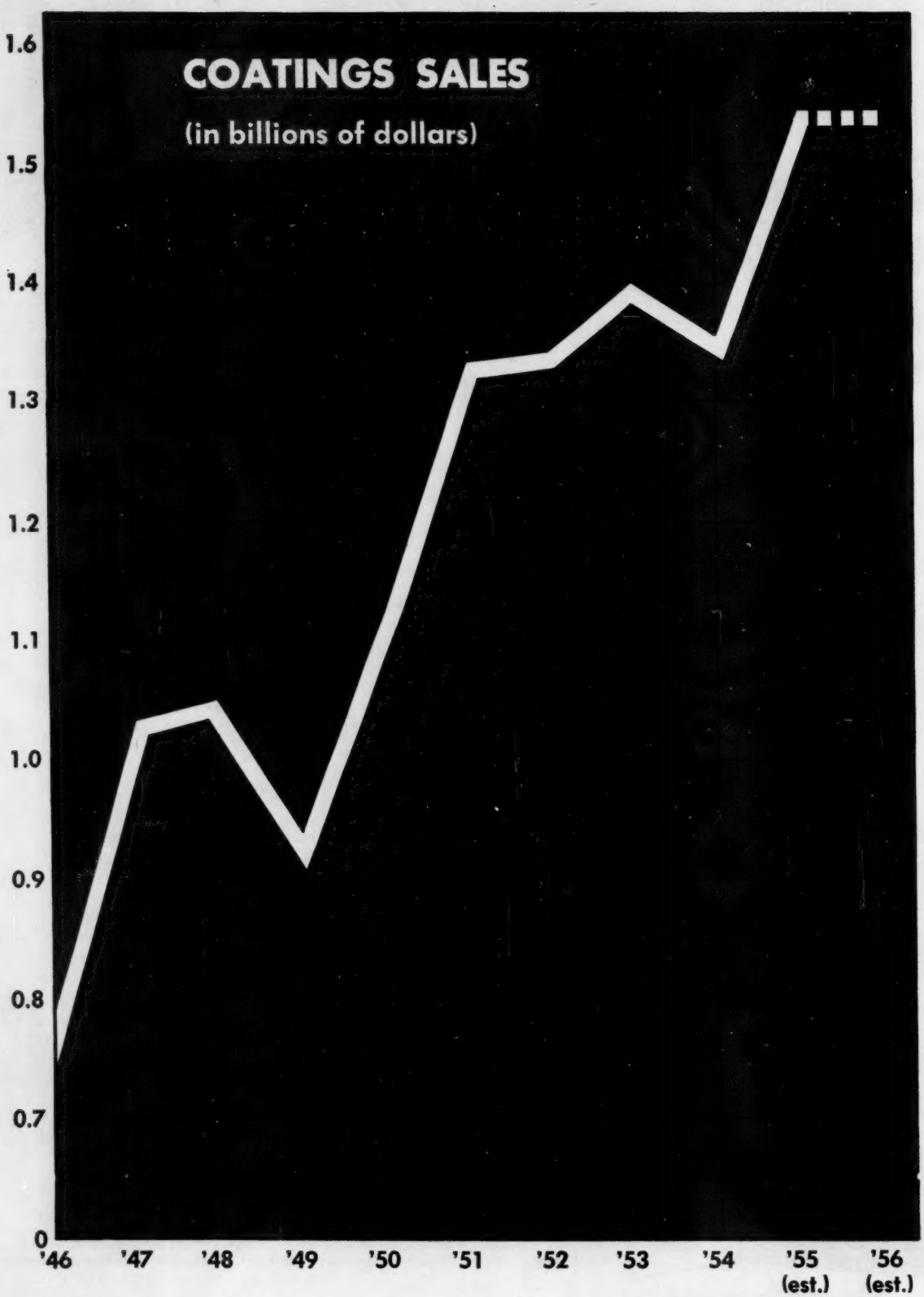
Shipped from Hopewell, Va. in bulk and in 100-lb. moistureproof multiwall bags. Write for samples, quotations, literature, technical service with no obligation.

Dept. NI 1-7-1

Allied Chemical — NITROGEN DIVISION

40 Rector Street, New York 6, N. Y.

Ethanolamines • Ethylene Oxide • Ethylene Glycols • Urea • Formaldehyde • U. F. Concentrate—85 • Anhydrous Ammonia • Ammonia Liquor • Ammonium Sulfate • Sodium Nitrate • Methanol • Nitrogen Tetroxide • Nitrogen Solutions • Fertilizers & Feed Supplements


COATINGS SALES
(in billions of dollars)
1.6
1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0
'46
'47
'48
'49
'50
'51
'52
'53
'54
'55 (est.)
'56 (est.)

C W Report

by Harry Burrell

Coatings: How to Sell a $700-Million Market

Coatings industry sets new sales high in 1955, counts on "do-it-yourself" rage to maintain the pace, carry sales to $1.5 billion again in 1956.

A top chemical market, the coatings industry this year will spend $700 million for chemical and allied raw materials.

Here, in detail, is what the market looks like, how it can be cultivated:

Judging by the trend of the last five years plus business forecasts for 1956, coatings industry sales this year should equal the record levels of 1955. Some market men predict even better times in view of 1956 being an election year. Credit restraints and elimination of quick depreciation allowances by the government may slow new construction sales slightly, but the "do-it-yourself" trend could pick up the slack, keep trade sales about where they were. Little net change in the industrial pattern is expected.

Industry men figure that coating sales this year will reach over $1.5 billion (*see chart: Coating Sales*). About half of this, in turn, will end up in the chemical industry's collective pocket as payment for raw materials. This tab represents a highly coveted market for many different process products (*see chart: Budget Item*). The major portion of this market, naturally, falls to vehicle components and pigments, since these are essentially what a paint company sells. In

Where Coatings Go

(in millions of dollars)

Year	Trade Sales			Industrial Sales			Total Sales
	Repair and Maintenance	New Construction	Total Trade Sales	Paint, Varnish and Enamels	Lacquers	Total Industrial Sales	
1951	$610	$197	$807	$396	$136	$532	$1,339
1952	620	211	831	388	122	510	1,341
1953	630	210	840	420	142	562	1,402
1954	630	208	838	389	134	523	1,361
1955 (est.)	700	234	934	460	156	616	1,550
1956 (est.)	710	220	930	462	158	620	1,550

C W Report

more detail, however, here is the market picture for 1956:

The Big Slice: As in the past, two different product groups will control almost two-thirds of the market: colors and resins will command 63% of all dollars spent by the coatings industry on raw process materials. Of the two, colors are expected to come out at year's end with a slight edge, shading resins 31.6% to 31.4%.

It won't come as a surprise that white will again prove the most popular color; but probably few would guess that the demand here will be as much as 55% of the total demand for colors (*see table: Color Purchases*). And, again, titanium dioxide will supply 73% of this demand for whites. (It is not correct to extrapolate these figures to determine the colors of paints actually sold, because some of the white and other pigments are blended to give pastel shades and hues.)

As far as prime color purchases are concerned, yellows, oranges and reds seem to be next in line for the sales dollar, with greens, blues, blacks, browns and purples trailing in that order. Current automobile styling in brighter colors has, of course, had its impact on pigment suppliers, and possibly the trend will spread to other consumer items as well. But since total sales of the nonwhite prime pigments are only about 17% of the total spent for all colors, the effect of increasing demand for bright colors will probably not significantly change the over-all picture.

Resin Outlook: Alkyds will again lead the resin field in sales by a wide margin, this year (*see table: Resin Purchases*). This is probably the last year that phenolics will remain in second place; demand for phenolics has been slowly decreasing for several years. The growing importance of epoxies for industrial uses and the butadiene-styrene latexes for trade sales is emphasized by the fact that they nearly match phenolic resins in dollar volume. It is a pretty safe bet that by 1958 the epoxies will be second in importance; and by 1960, they may be nearing half the alkyd sales.

Three reasons for expanding epoxy growth:

- It's an attractive market. The high price per pound keeps the dollar volume up even though the quantity sold does not equal that of other resins.
- The cost is apparently justified by the high quality imparted to coatings.
- Competition is appearing from at least six* major companies in a field dominated by one firm (Shell).

Production capacity for bis-phenol and epichlorhydrin, the principal raw materials needed by epoxy makers, has increased. And coatings technicians are hoping for a break-through in the epoxy price situation soon. Even a drop of a few cents per pound will substantially enlarge the market.

So far, epoxies have been used only where definite demands were made on paint manufacturers to furnish new coatings with better alkali-, soap-, abrasion- and water-resistance. But there are many conventional places where they could be used to advantage once costs become competitive.

Slow Seconds: Demand for butadiene-styrene resins also will continue to grow, but the opportunity for really large expansion is not great. The only real advantages that these materials have are their moderate price and their ability to be thinned with water.

*Bakelite, Ciba, Borden, Minnesota Mining & Manufacturing, Jones-Dabney, and Dow.

HARRY BURRELL'S QUALIFICATIONS to survey the coatings industry as a chemical market:

- Long-time coatings researcher, he has headed Interchemical Corp.'s vehicle laboratory since 1948 . . .
- A background of 12 years in research with Ellis-Foster and Heyden Chemical.
- He has numerous patents and publications in the coatings field to his credit . . .
- And he has played an important role in developing the commercial potential of pentaerythritol resins in paints.
- A graduate of Newark College of Engineering (B.S., Ch.E.), he has been both teacher (assistant professor, Stevens Institute of Technology, 1947-52) and consultant (1946-48) during a busy 20-year career.

After the workday is done, he returns to home and family at 1468 Burney Lane in Cincinnati and, when not occupied with writing assignments, finds relaxation in photography, gardening and art.

THE SLIP THAT HUDSON INKED OUT!

Slippery bags may be merely a source of mild irritation . . . but they can also be the cause of serious injury to both man and business.

Literally, Hudson *inks out* this hazard. Non-Slip inks, now standard on Hudson Multiwalls, put the brakes on slippage. When stacked, they cling to each other like honeymooners in the dark. Shipped in bumping trucks or humping boxcars, Hudson sees your product through *securely*.

If you'd like to know more of the Hudson story as it relates to your business . . . such as *certified supply* through complete integration from Hudson-owned forests to Hudson-made kraft . . . or *sure-time delivery* through controlled scheduling from four strategically located plants . . . use the coupon and we'll be glad to visit at your convenience.

DESIGNED to DELIVER the PRODUCTS of PROGRESS

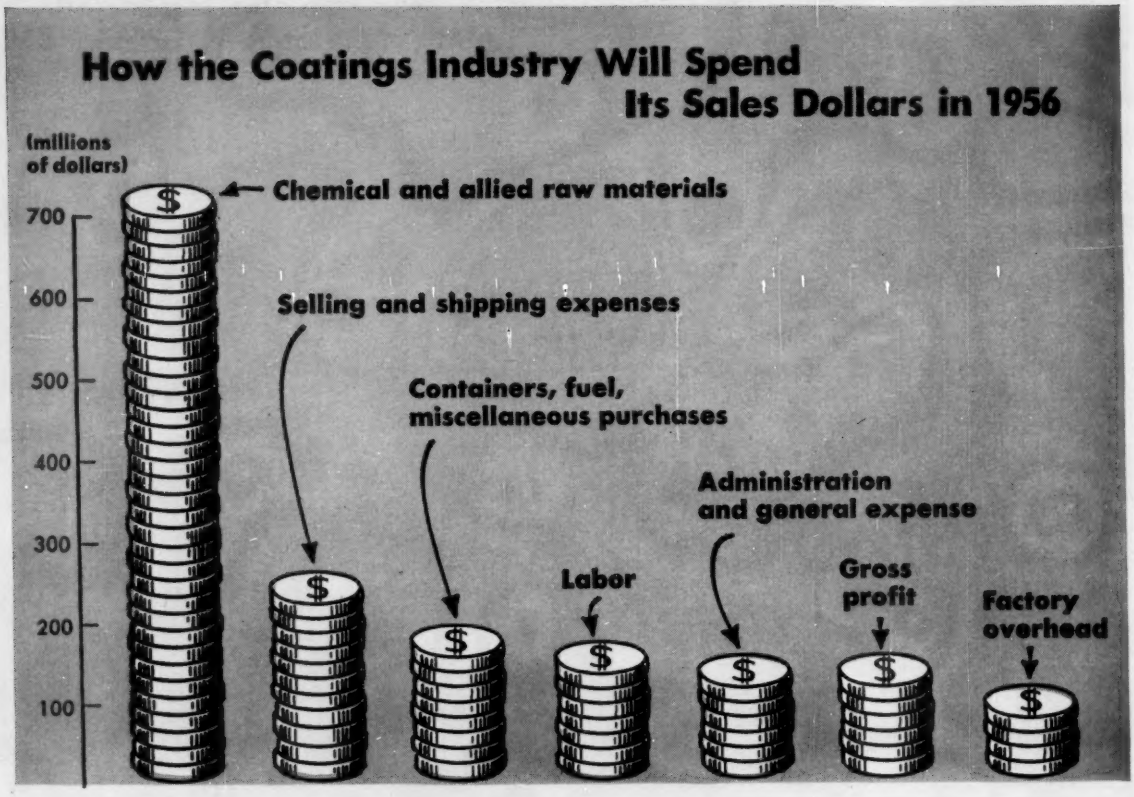
Plants at
CHARLOTTE, N. C.
PALATKA, FLA.
PINE BLUFF, ARK.
WELLSBURG, W. VA.

HUDSON PULP & PAPER CORP.
477 MADISON AVENUE • N.Y. 22, N.Y.

HUDSON PULP & PAPER CORP.
477 MADISON AVENUE • NEW YORK 22, N. Y.

Yes! We'd like a copy of the 46-page illustrated book on "What to Look for in a Dependable Source of Supply," and details on the Hudson guarantee.

NAME_____ TITLE_____
COMPANY_____
ADDRESS_____
CITY_____ ZONE____ STATE_____



C W Report

These so-called water-base paints have been well accepted by the amateur interior decorator, but the field has been thoroughly exploited. In fact, manufacturers of the older oil-base types have begun to recapture lost ground with better formulations, low-odor solvents and better promotion.

Furthermore, present indications are that the real quality latex paints of the future will be made with acrylic resin dispersions instead of butadiene-styrene resins. Nor should polyvinyl acetate suppliers be counted out; if cost should ever become the really dominant factor, they would be in the driver's seat. There are those who look for new water paint markets in exterior applications, and they may be right. But even if these markets materialize, they will probably be controlled by acrylics or polyvinyl acetate rather than the styrene-butadiene latexes.

Strong First: Alkyd-amine systems are still the favorite for industrial finishes. They have been known for so many years that their technology is well advanced, and current improvements are subtle and slight. Since the present use of alkyds is already so large, improvements are not apt to materially change the relative picture even when they are as interesting and important as the new thixotropic-gel type used for no-spill, no-drip paints. Their position may possibly be threatened only by lower-priced epoxies.

The vinyls are helpful wherever extreme corrosion and chemical resistance are required, but low solids and poor adhesion limit their use.

Hidden Market: This year, the coatings industry will spend $95 million in the direct purchase of fatty acids and oils (*see table: 1956 Purchases of Oils and Fatty Acids*). But this doesn't reflect the full value of the market, because $37 million worth of additional fatty acids and oils (particularly soy oil) will enter the industry indirectly via purchased alkyds, and the like.

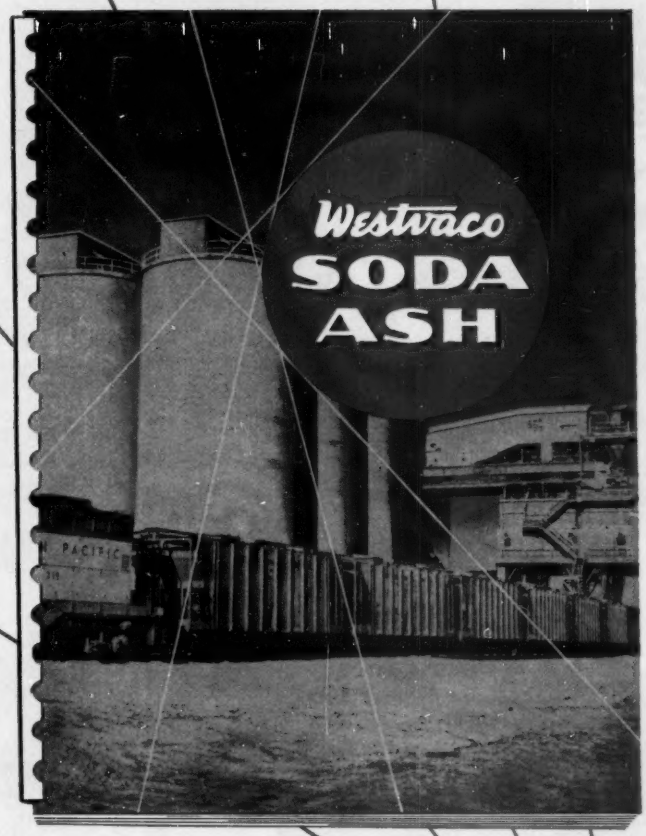
Still the favorite vehicle for outdoor house paint, linseed oil will again command the largest share of this market, constitute 55% of direct fatty acid and oil purchases. How popular latex-base exterior paints will be five years from now is anybody's guess; but this year, at least, they will make no serious inroads on linseed oil. Alkyd-extended oils actually appears to be the next logical step forward; and this, of course, would continue, or possibly might even increase, the oil demand.

Far behind linseed oil in demand (only 13% of direct fatty acid and oil purchases) but still in the No. 2 slot, tung oil will hang on to this position throughout 1956. Used largely for industrial applications, it is still indispensable in many places. Last year's domestic tung oil crop is reported to have frozen out, so prices will hold, at least until late in the year.

How Long? How long will it be before drying oils are relegated to

this book contains 42 pages of information and illustrations valuable to every soda ash user.

send for your copy today!



If you use or may use soda ash in your processes, you'll find a wealth of valuable information in this new book. We believe it is the most enlightening catalog-data book yet to be published on soda ash. The first 20 pages will give you a new concept of soda ash and how good it *can* be. Succeeding pages contain specifications, handling data, many useful charts and helpful tabular technical data.

Published in a limited edition, this is not a book for the tyro or the idly curious. It is a valuable text for every present and prospective alkali user. A letterhead request or the handy coupon at the right will have our prompt attention.

I am interested in knowing more about WESTVACO Soda Ash. Please send a copy of your new Soda Ash book to

NAME_____

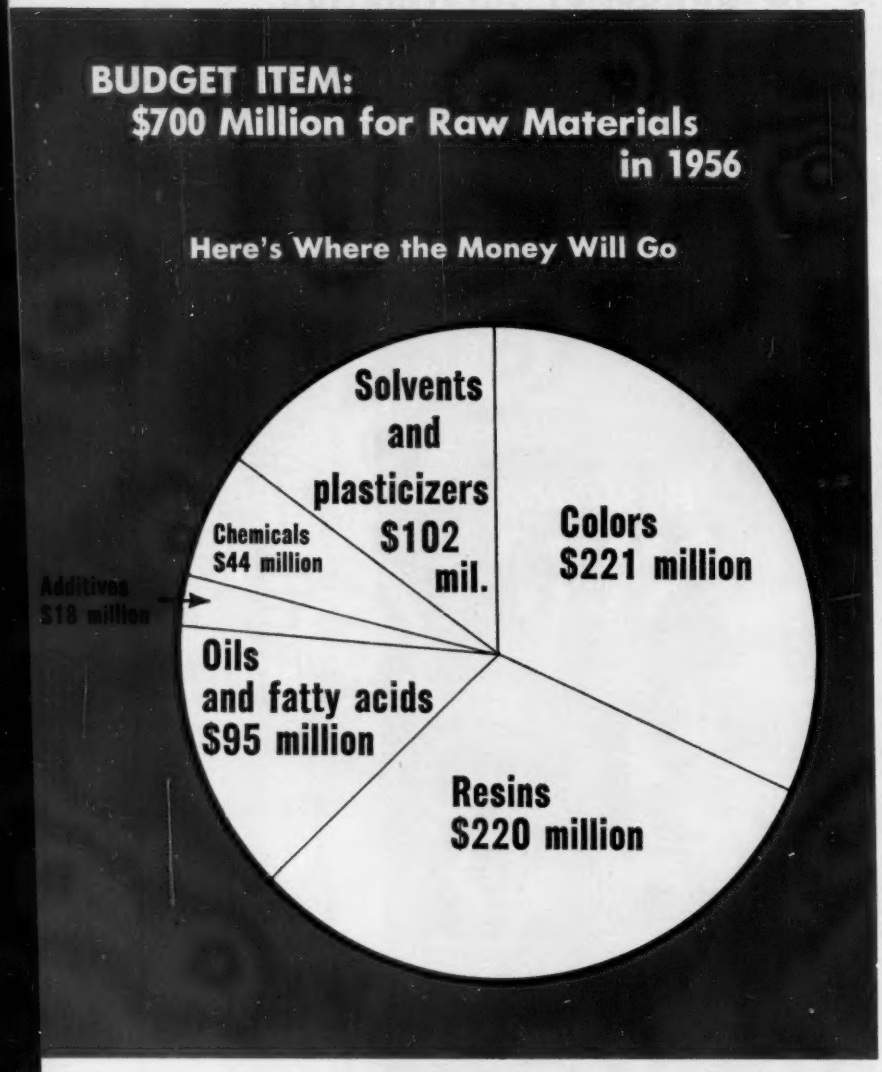
POSITION_____

COMPANY_____

ADDRESS_____

Westvaco Chlor-Alkali Division
FOOD MACHINERY AND CHEMICAL CORPORATION
General Offices • 161 East 42nd Street, New York 17
CHICAGO • ST. LOUIS • DENVER • PHILADELPHIA • SOUTH CHARLESTON, W. VA.

fmc FOOD MACHINERY AND CHEMICAL CORPORATION
Westvaco CHEMICALS


BUDGET ITEM:
$700 Million for Raw Materials in 1956
Here's Where the Money Will Go
Solvents and plasticizers $102 mil.
Colors $221 million
Chemicals $44 million
Additives $18 million
Oils and fatty acids $95 million
Resins $220 million

C W Report

museum cases? Probably not in this century, anyway; but the question is not out of order. Oil producers are suffering from technological obsolescence.

The remedy, as recommended by the many different groups that have studied the situation, is intensified research. Much has already been done, of course, particularly by the Dept. of Agriculture regional laboratories, to brake the descent; but a greater industry effort is still needed.

Volume Market: Grouped together by convention, solvents and plasticizers account for almost 15% of total raw material purchases. While plasticizers appear to be important market factors, the impression is misleading.

Actually, plasticizers themselves will constitute less than 0.5% of the coating industry's raw material market this year (*see table: Solvent and Plasticizer Purchases*). This low figure may seem surprising, especially when compared with figures for total plasticizer production (*CW Report, April 16, '55*). But the microscopic film thickness and large exposed areas of coatings are not conducive to plasticizer retention; in most, cases, external plasticizers serve as little more than softeners in this field. Wherever possible, the paint chemist prefers to internally plasticize his film-formers.

Solvents, of course, are a significant market factor. This year, sales of solvents to the coating industry will total almost $100 million; but it will take tremendous volume to reach this total. In 1956, hydrocarbon solvents will, as usual, command the largest share, both in dollars and in gallons. Least expensive, least odorous, least toxic, and least objectionable, they will again be used to the greatest extent in the greatest number of places.

Aliphatics will dominate the demand (principally in trade sales) for vehicles with high oil content, while aromatics, which have a higher solubility parameter, will appear in industrial sales, where the demand for hard resins and ester groups predominates. It is in the industrial field also that the oxygenated solvents will find their principal use.

Volatile Market: The solvent business is highly competitive, make no mistake about it. And this competition is just what the paint manufacturer thrives upon, for he really would prefer not to buy solvents at all. The solvent disappears from the final deposited coating, once it has served its temporary purpose of lowering viscosity long enough to get the film laid down.

Not only does the user of coatings object to buying something he ultimately loses, but also his distress is compounded by fire hazards, odor and toxicity problems. There is great pressure on suppliers of organic coatings to eliminate solvents entirely, or at least replace them with water. The current work on air pollution control will accentuate this pressure.

It is fortunate that the petroleum industry has become the main supplier of solvents. Handling large volumes of low-cost fluids is their specialty. They are also able to support the research necessary to prevent solvents from getting into the competitive rut in which vegetable oils find themselves. For example, the so-called odorless thinners

it pays to see VICTOR

Fire Protection for Precious Property

Best way to prevent fire (and perhaps save a life) is to *flameproof*. Victor ammonium phosphate is just such a flameproofer—low in cost, yet remarkably effective in rendering flameproof such fire feeders as many insulation materials, wood, paper products, draperies, house paints—even little girls' clothing.

If you make a product that's flammable, investigate Victor flame-proofing chemicals that make your product safe, and add an important new sales feature.

Use the coupon for further information about Victor flame-proofing chemicals.

SODIUM PHOSPHATES . . .
Versatile Performers for Industry

As most any manufacturer of detergents and soaps can tell you, Victor sodium phosphates make all the difference in the world in the effectiveness of these products. That is why these versatile performers are standard in so many detergent and soap formulas. A long list of other products—cement, paper, industrial cleaners, oil drilling mud, to name a few—benefit through the use of hard-working sodium phosphates.

Check the free Victafiles listed on the next page for the one that tells about the Victor Chemicals being profitably used in your industry.

Dyed in the Wool

With the help of Victor diammonium phosphate (and somewhat more practical equipment), this amateur might easily qualify as a professional dyemaster. That's because, in dyeing natural fibers and synthetic worsted blends, diammonium phosphate is so dependable that even a child could be entrusted with its use. This remarkable chemical maintains rigid *automatic* control of the dye bath.

Victor diammonium phosphate assures maximum penetration, uniformity, levelness, a gradual increase in acidity that assures proper fixation and exhaust—meets every high performance requirement of delicate or specialized dyeing jobs at low, low cost.

And for many standard dyeing jobs, Victor formic acid is the favorite among leading textile processors. It *pays* to see Victor.

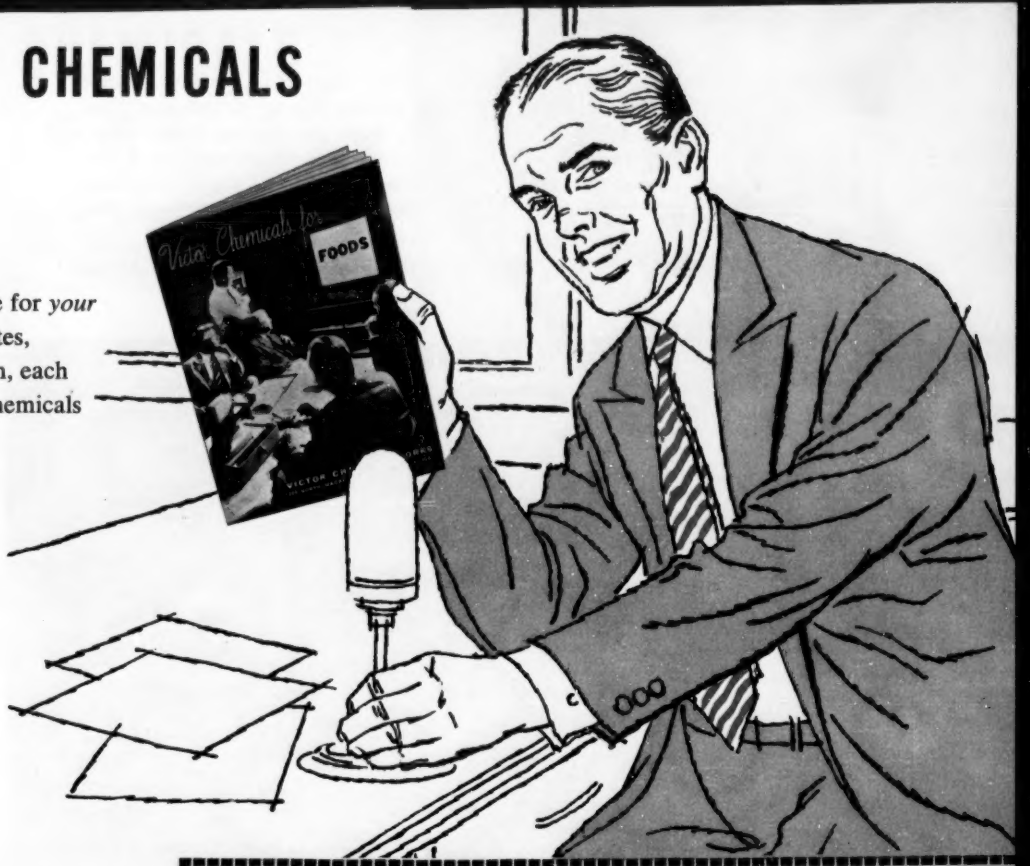
Former major leaguer Tony Piet works out with Little Leaguers

PHOSPHATES keep "Dad" off the bench

Food fortified with Victor phosphates help proud papas keep pace with active sons. With tremendous appeal to homemakers, many mineralized foods literally "sell" themselves. Today, cereals, baby foods, milk drinks and bread are among the many food products fortified with Victor phosphates.

Victor calcium and iron phosphates may be added to foods at practically no cost. For full details, send for the free Victafile on Foods and Beverages. It pays to see Victor.

NEW FACTS ABOUT VICTOR CHEMICALS FOR YOUR INDUSTRY...



Here's a brand-new concept in chemical literature that's tailor-made for *your* industry. Each Victafile contains complete data on Victor phosphates, formates, and oxalates used in *your* industry. In simple, concise form, each Victafile provides important technical information on the Victor chemicals you can use to cut costs, increase production, or add sales appeal.

SELECT THE VICTAFILE FOR YOUR INDUSTRY

Agriculture
Chemical Manufacturing
Dentifrices
Detergents and Soap
Flameproofing
Food and Beverages
Glass, Ceramics and Vitreous Finishes
Industrial and Household Cleaners
Leather Tanning
Metal Finishing and Rustproofing
Mining and Drilling
Paints
Petroleum Products
Pharmaceuticals
Plastics
Pulp and Paper
Textiles
Water Treatment

VICTOR
Dependable Name in Chemicals for 58 Years

Printed in U.S.A.

CE 1234

Victor Chemical Works
155 N. Wacker Drive
Chicago 6, Illinois

Please send Victafile showing uses of Victor chemicals for our industry.

FIRM NAME_____

ADDRESS_____

CITY_____ STATE_____

YOUR NAME_____ TITLE_____

INDUSTRY_____

(Please attach this coupon to your letterhead)

☐ We have a particular problem; if there's no obligation, please have technical service representative call.

C W Report

are now made by six* companies at the rate of 15 million gal./year. They have fostered better public acceptance of oil paints, put them back in the running with latex types. Petroleum companies have also turned their attention to the oxygenated solvents, usurping what formerly was strictly a chemical manufacturers' market.

Chemical Cut: Direct chemical purchases may not account for the largest slice of raw material sales, but some of the most attractive markets will be found here (*see table: Chemical Purchases*). And, as in the case of resins and oils, the direct chemical purchases are augmented by sizable amounts of chemicals sold indirectly to coatings manufacturers.

In 1956, three items alone—glycerol, pentaerythritol and phthalic anhydride—will account for over 70% of the total chemical purchases (or over $30 million). Although each of the items is in plentiful supply (except for occasional temporary shortages such as occurred for phthalic in the summer of '55), the market apparently still looks attractive to both present and potential producers. Capacity for all those items was increased repeatedly throughout 1955.

One of the most interesting developments here is Shell's new peroxide-acrolein process to make glycerol, which will apparently free its chlorhydrin process for manufacture of Epon resins. At the same time, the nine* producers of pentaerythritol are planning to double 1955 capacity. The phthalic forecast is a little harder to tie down, but apparently there is plenty of production capacity. Naphthalene will probably have to be augmented by *o*-xylene, but the terephthalate polyester program has promoted increased xylene-isomer production. The real problem here will be what to do with the *m*-xylene, because isophthalic acid made from the *m*-isomer is still largely of unproved commercial utility.

Of the other items in this group, most of the styrene will be used to modify alkyds or oils, while the phenol and formaldehyde will find ready demand in phenolic resins. Substantially all of this $44-million market value represents a real market because few paint companies (Sherwin-Williams and Du Pont excepted) manufacture their own chemicals. Some of the indirect chemical purchases (e.g., PE for alkyd resins) will come from captive raw material sources such as those of Hercules and Reichhold.

*Atlantic, Phillips, Richfield, Sinclair, Shell, and Socony Mobil.

*Trojan, Hercules, Heyden, Reichhold, Delaware, Warren, Commercial Solvents, Celanese, and St. Maurice.

CONFUSION COMPOUNDED

One thing that makes poker interesting is the possibility of drawing over 2.5 million different five-card hands from a 52-card deck. Somewhat the same fascination (often laced with frustration) pertains to the paint industry; but here, too, there is the danger of getting lost in the shuffle.

From the 1,000 different raw materials usually stocked by a good-size coatings company, almost 10 trillion different formulas containing only five ingredients are possible. When quantities and grades of each ingredient are considered, as they must be, this number becomes astronomical. Then, this complexity is further compounded by the introduction of 400-500 new ingredients every year.

Scientific Selection: It is doubtful that outsiders appreciate the complexity of production problems arising from a situation such as this. At the same time, for those interested in selling the industry, it has some significant connotations:

- Mortality on new developments passing over the lab benches is high, merely from intense competition.
- A large demand exists for many diverse items to enable individual firms to keep up with competition.
- Quality, economy and genuine utility must exist in every item, else it will soon be displaced.
- In choosing raw materials, considerable science has evolved by necessity from what was essentially an art 20-30 years ago; otherwise, weeding out offerings would be an almost impossible task.

Although many of the raw materials are approximate chemical duplicates—differing, perhaps, only in brand-name or some minor constituent or property, the formulator has learned through adverse experience that what appears to be an acceptable substitute in one formula may not work at all in another. Subtle differences, which frequently defy scientific explanation, will insure complete success in one end-product, yet result in complete failure in what appears to be an analogous use.

As the causes of such variations are discovered, improved specifications become possible. At present, however, there are still many questions to be answered: It is known, for example, that particle size and water solubles in pigments must be controlled. But what are the effects of particle size distribution? Coatings chemists cannot even measure this factor accurately. Acid number, viscosity, color and other physical properties are all important in resins, of course, yet why do two materials that analyze the same, or even come from the same company, from the same formula, but from different plants, vary in performance? Might this be a function of molecular weight distribution? It is known that the distribution curve can be varied by different reaction rates, but no one knows the effects.

This tenuous diversity is mentioned not only to explain how the multitude of raw material items can coexist, but also to solace suppliers who find that one coatings company is a good customer, whereas its competitor is a poor prospect.

1956 PURCHASE OF COLORS

(in millions of dollars, estimated)

Pigments	Purchases	
Zinc oxides*	$20.0	
TiO_2*	89.0	
Lithopone	5.0	
White lead and others	8.5	
Total whites		**122.5**
Total blacks		**2.1**
Inorganic reds	5.7	
Organic reds	5.3	
Total reds		**11.0**
Inorganic greens	3.5	
Organic greens	1.6	
Total greens		**5.1**
Total browns		**0.8**
Total purples		**0.4**
Inorganic blues	0.6	
Organic blues	2.7	
Total blues		**3.3**
Inorganic yellows and oranges	13.1	
Organic yellows and oranges	0.7	
Total yellows and oranges		**13.8**
Total prime pigments		**159.0**
Inerts		
Magnesia types	8.5	
Alumina types	1.4	
Silica types	3.5	
Barium types	0.8	
Calcium types	38.0	
Others	1.4	
Total inerts		**53.6**
Metallic bronzes		**7.8**
Dyes		**0.6**
Total colors		**$221.0**

*Includes extended grades.

C W Report

Off the Bottom: Of materials usually grouped together as additives, most are trademarked items, the composition of which is seldom revealed (*see table*: *Additive Purchases*). Consequently, it is difficult to give many particulars on 1956 sales, except for driers (*see table*: *Breakdown of Drier Purchases*).

Naphthenates, principally lead and cobalt, will be by far the preferred driers. Tallates will rate second in importance (because of their economy), followed by the newer, pale octoates, and, in turn, by the older linoleates and resinates, whose use has not yet been wholly superseded.

Although they will comprise only a small fraction of the total purchases by coatings manufacturers, additives are extremely important, technically. Because they are frequently high-priced items, they are usually offered by specialty and small chemical firms.

How to Sell the Coatings Industry

In order to operate in 1956, the coatings industry will spend about $700 million for process raw materials (*see chart*: *How the Coatings Industry Will Spend Its Money*). Which suppliers will get the business? Ignoring the important factors of psychology, salesmanship and reciprocity, the answer is familiar: those who offer the best price and dependable service.

Prices, of course, must be based on precepts of sound business management; but service is a personal factor greatly dependent on the salesmen. Many suppliers and their representatives do not understand the organization, function, and problems of a coatings manufacturer. Those who do are in a position to provide the best service, get the cream of the business. Here is a brief sketch of the industry, its problems and purposes:

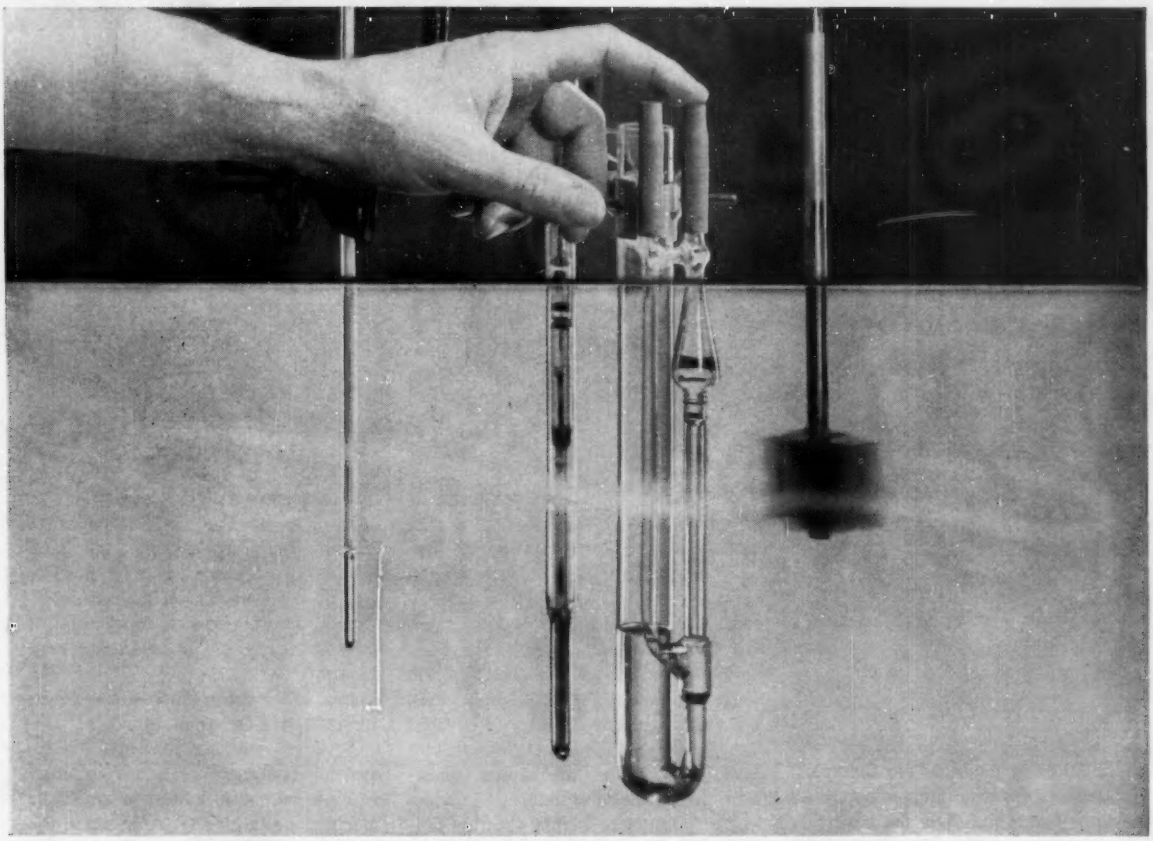
Service for Sale: First of all, the coatings business is essentially a service business itself. Any industry that spends such a large proportion of its sales dollar on raw materials is dependent on the skill and efficiency with which these goods are converted into finished products.

The usual division into trade sales and industrial sales exists not only because the products are compositionally different, but also because sales

viscosity control

. . . starting point for improved products

maintain uniform viscosity in your product with METHOCEL a synthetic gum



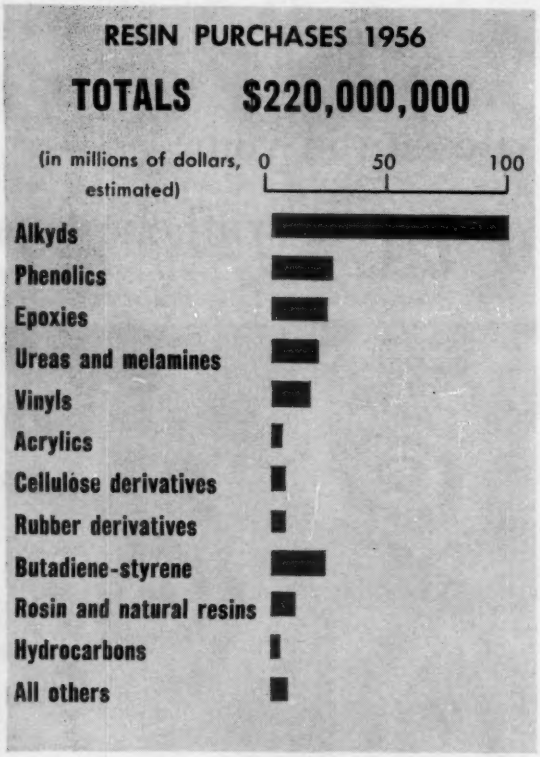
Measuring viscosity of solutions of Methocel in the Ubbeholde Viscosimeter.

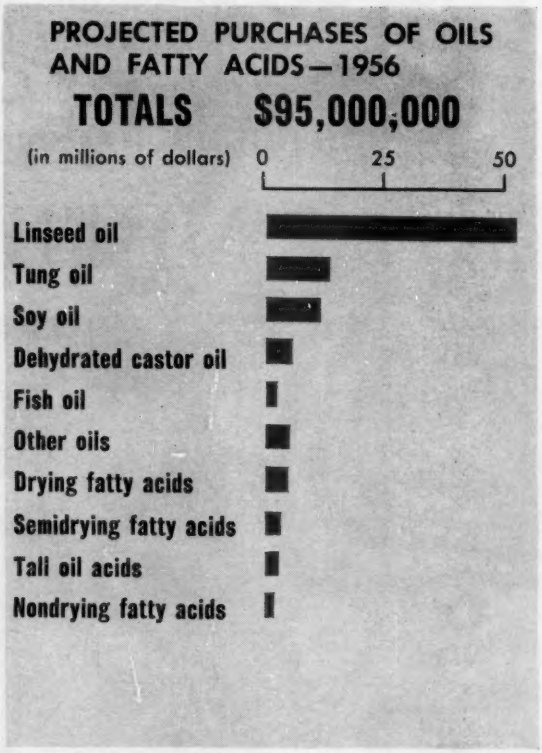
Uniformity is important in the material you choose for the vital job of viscosity control. To assure complete uniformity of Methocel® (Dow methylcellulose), production runs of this superior cellulose gum must pass a standard viscosity measurement. Solutions of Methocel are subjected to a very exacting measurement by timing the rate of flow through a capillary type of tube in the Ubbeholde Viscosimeter.

Range of viscosity is important, too. Methocel is available in nine different viscosity types, covering a broad range from 10 cps to 7,000 cps, as measured in 2% aqueous solutions at 20°C. By varying this concentration, an even greater range of viscosities can be obtained.

Viscosity control with Methocel has simplified processing and improved many products. Colorless, odorless, inert and remarkably stable solutions of this gum are also widely used as a stabilizer, thickener, suspending agent, binder and film former. For a free sample or assistance on your specific problem, write to THE DOW CHEMICAL COMPANY. Midland, Michigan, Dept. ME 826B-4.

you can depend on DOW CHEMICALS DOW





C W Report

requirements are quite diverse and merchandising methods are far apart. Trade sales, for example, include small package goods sold over the hardware or paint store counter to individuals who may be householders or professional painters. This material gets into and onto houses, offices, public buildings. Exterior durability, fast air-dry, and easy brush application are prime requisites here.

When used on a somewhat larger scale (on large buildings or in various manufacturing plants), the same products are known as maintenance paints. These are sometimes treated as industrial coatings because they exhibit one of the distinguishing features of industrial sales—bulk or large-volume handling (at least that is what the industrial paint manufacturer hopes for).

Job-Rated: But industrial products go much further than that. They are usually sold to meet definite performance specifications, and invariably have to be applied rapidly enough to meet production line schedules. This almost always means that they must be baked on instead of air-dried. In some applications, for example, they must dry within a few seconds, hold their color at high temperatures, and have much better mechanical resistance than trade sales items.

The point here is that the raw material requirements for trade sales are quite different from those for industrial goods. The linseed oil and white lead salesmen are wasting time when they go after industrial coatings representatives. Likewise, the urea resin or polyvinyl chloride salesman who visits a trade sales plant would be just as useful at a ball game.

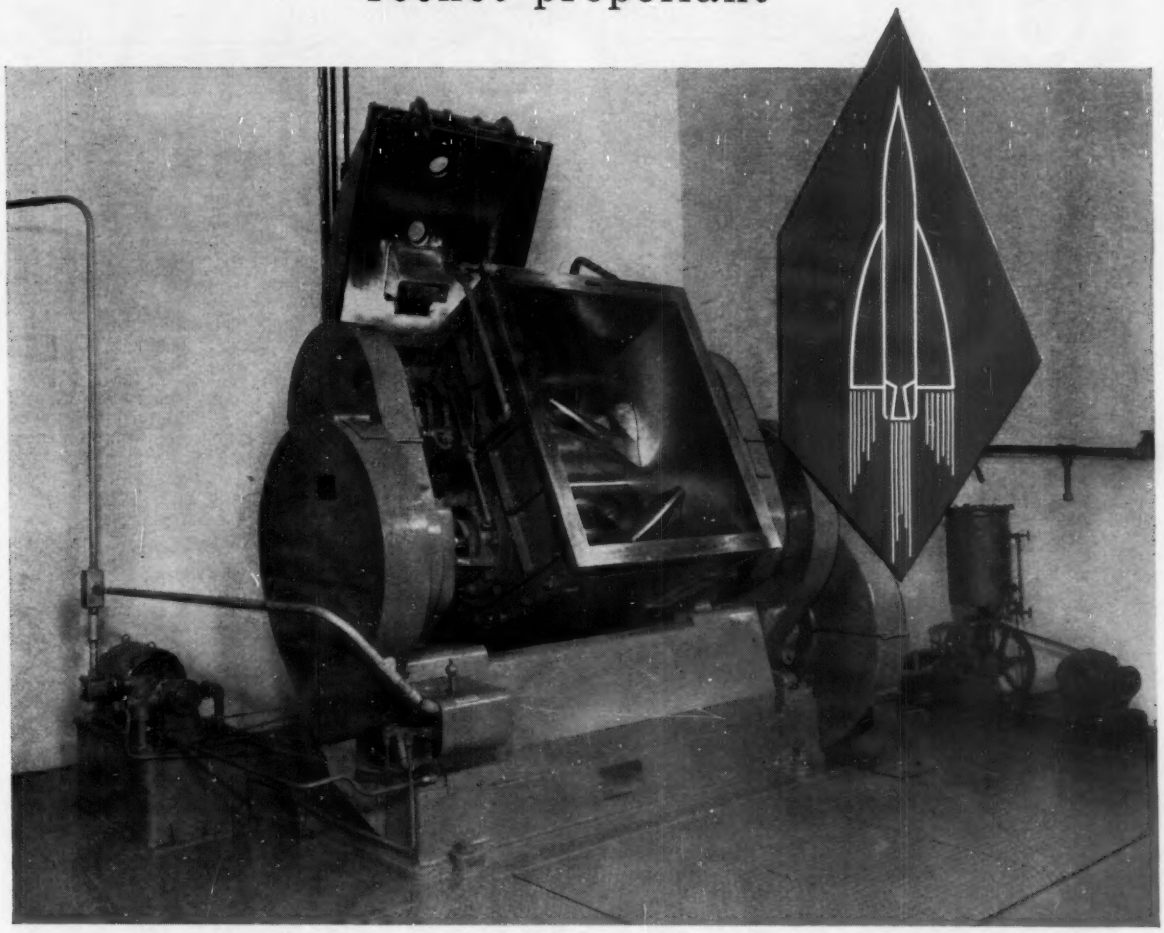
Sorted by Size: The most significant difference between trade sales and industrial sales, and one that best points up the different requirements, is that industrial sales are built around a well-staffed, well-equipped laboratory, while trade sales laboratories, where they exist, must be justified by an unusually large scale of operation.

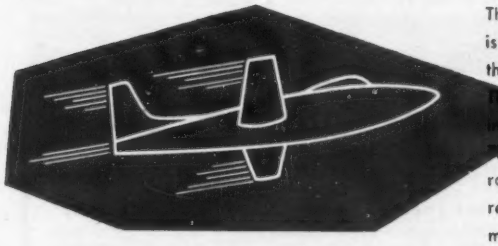
By the same token, in order to absorb the indispensable and considerable laboratory work required to give adequate industrial coatings service, a reasonable-size operation is essential. There are many small manufacturers of trade sales items, but nearly all industrial coatings plants are relatively big operations.

Because the requirements for industrial coatings are more exacting and varied, raw materials must be specified more closely. And, since the laboratory facilities are available, most industrial coatings plants operate with at least a minimum of raw material control. This, in turn, means that raw materials offered for industrial coatings manufacture must be held within much closer limits than those normally supplied for trade sales.

Another important consideration for material suppliers: it is in these laboratories that new offerings are evaluated, improved coatings developed. Of the approximately 10,000 chemists working in paint laboratories throughout the country, the vast majority are concerned with industrial products. New items aimed at this field, obvi-

Thiokol® Chemical Corporation selects BAKER PERKINS mixers for processing rocket propellant



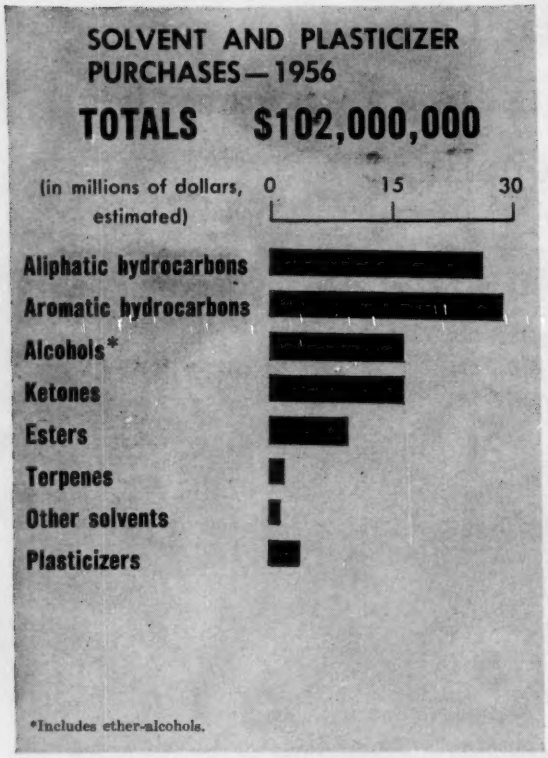


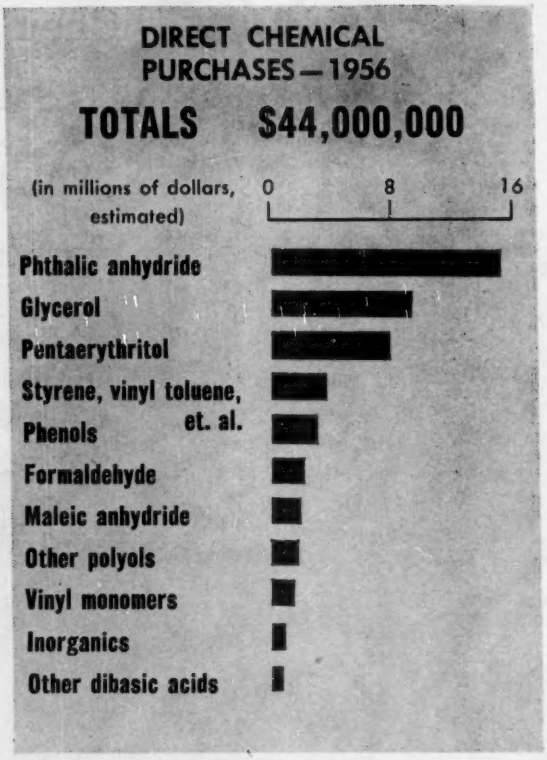
The mixing of rocket propellant from new high-energy fuel materials is a sensitive, highly demanding operation. The mixers which do this blending must therefore be not only efficient, but dependable. The Baker Perkins No. 15 Mixer shown here is but one of many in operation in the rocket propellant field. This unit at the Thiokol Chemical Corporation is enclosed in an explosion-proof room of reinforced concrete, and is engineered for complete remote control operation. Powered by a 50 H.P. silent chain drive motor, the No. 15 Mixer is constructed of Stainless Steel, and jacketed to carry 125 psi pressure of steam or water. Its Sigma blades revolve on anti-friction bearings, hydraulic tilt is provided for the mixing chamber, and the vacuum cover is pedestal mounted. Working capacity of this mixer is 100 gallons, and total capacity 150 gallons. If you have a process that calls for a high-performance mixer, write Baker Perkins for complete catalog.

Baker Perkins Inc.

Chemical Machinery Division
Saginaw, Michigan

333





ously, will receive the most attention.

Hard Sell: Development of a new formulation or evaluation of a new raw material is a costly, lengthy, and often tedious process. Exposure tests, for example, frequently take years; in many cases, accelerated laboratory tests, although indicative, are not conclusive. The legal liability of a coatings manufacturer is so great that he must be sure of what is going to happen before he sells his paint. Otherwise, he may have a claim on his hands for a hundred times the value of the paint he sold.

Consequently, the coatings chemist must have a very good reason to include a particular item in his program. A mere guess that "this ought to be good for your product" is not enough. Definite, clear data supported by careful laboratory work on the part of the supplier is what is needed: physical constants, compatibilities, behavior when exposed to heat, light, water, solvents and chemicals must be known.

Most suppliers make the mistake of suggesting finished formulations that incorporate their products. Usually such formulas are so ancient, so ineptly compounded, or so naive, that they are of little value. It would be far better for the salesmen to show how some physical property, such as hardness, water resistance, or color retention, varies with different proportions (without regard to whether or not the formulations are "practical"). The raw material supplier is in no position to know what is practical for a given coating end-use. The coatings manufacturer himself does not know from day to day what properties he will be required to produce for a given end-use, nor what compromises he may be forced to make to obtain his prime objective. It could well be that what a supplier regards as a de-

1956 Breakdown of Drier Purchases

(in thousands of dollars, estimated)

	Lead	Cobalt	Manganese	Calcium	Iron	Zinc	Totals
Naphthenate	$2,900	$2,770	$880	$480	$45	$410	$7,485
Tallate	605	920	190		15		1,730
Octoate	200	155		85			440
Linoleate	80	170	25	75			350
Resinate		115	65	35		85	300
Totals	$3,785	$4,130	$1,160	$675	$60	$495	$10,305

NEW WEATHER RESISTANCE

A new type of weather-resistant alkyd resin—made from isophthalic acid and *Glycerine*—is now being offered in experimental quantities.

The stability and compatibility of Glycerine as a polyol in surface-coating alkyds and its low MW/Hydroxyl ratio, have for years made a wide range of resin properties feasible.

Now Glycerine is combined with isophthalic, a dibasic acid which only recently became available in commercial quantities and which imparts higher viscosity with lower acid number. It also permits higher fatty acid content at workable consistencies. The result: excellent outdoor durability, mildew-resistance and gloss-retention—all demonstrated in a five-year exposure test completed recently. Among 100 alkyd-based enamels tested, an isophthalic-soybean-Glycerine alkyd enamel stood up best.

Here again, ***nothing takes the place of Glycerine.***

This balanced group of properties keeps Glycerine's usefulness growing

HYGROSCOPICITY • STABILITY •
SOLVENT POWER • VISCOSITY • NONVOLATILITY •
NONTOXICITY • TASTE • MW/HYDROXYL RATIO •

HUMECTANT •
CARRIER • SOLVENT • LUBRICANT • SOFTENER •
EMOLLIENT • ANTI-FREEZE • ALKYD BASE •

☑ CHECK AND SEND FOR TECHNICAL DATA

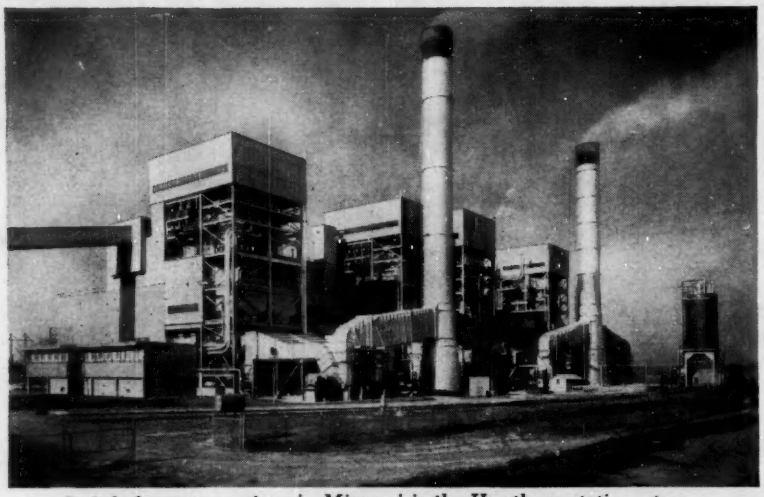
☐ 20-page booklet "Glycerine Alkyds Tailored to Need"

☐ 8-page booklet on "Federal Specifications for Glycerine"

☐ 16-page booklet on Glycerine properties and applications

For your free copy of any or all of these booklets write: **GLYCERINE PRODUCERS' ASSOCIATION** • 295 Madison Ave., New York 17, N. Y.

MISSOURI

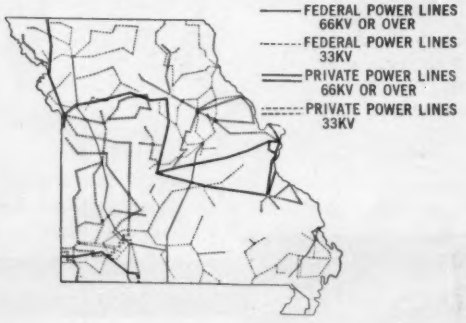


Typical of new power plants *in Missouri is the Hawthorn station, steam-electric generating plant of Kansas City Power & Light Company, located in Northeast Industrial district of Kansas City, Mo., with a nameplate capacity of 332,000 KW.*

POWER

Plentiful at Low Cost!

Whatever your power needs now—or in the future—Missouri can supply them and at low cost. New generating plants like the one above increase Missouri's power potential every year. And there still remain thousands of acres underlain with coal for suitable steam-electric generating plants.



High voltage transmission lines *carry private and Federal power to every part of the state, as this map indicates.*

Let us "tailor-make" a plant for you!

Under Missouri's now famous "Tailor-Made" plan, 136 million dollars worth of new plant construction was located here in 1954. Seventeen Missouri cities have acquired acreage and raised preliminary funds to help start your plant—built to your plans, then leased to you on long favorable terms. Or choose from 188 industrial buildings available now. Don't wait, get complete information on Missouri's power, water and many other advantages.

PHONE COLLECT *Jefferson City 6-7185*
Lisle Jeffrey, *Industrial Director*
or write Dept. C685
Missouri Division of Resources & Development
Jefferson City, Missouri

C W Report

fect could turn out to be an asset for some particular job.

High-Priced Incentive: A frequent mistake of suppliers is to assume that a small price reduction will insure "getting a share of the business." This may well be effective for relatively pure chemicals of standard composition. But for most of the items used in coatings, indeterminate differences exist in "equivalent" items offered by different suppliers (*see box: Confusion Compounded*).

Switching to a lower-priced item without careful evaluation would be foolhardy, and a careful evaluation might entail testing dozens of different formulas. Take this hypothetical illustration:

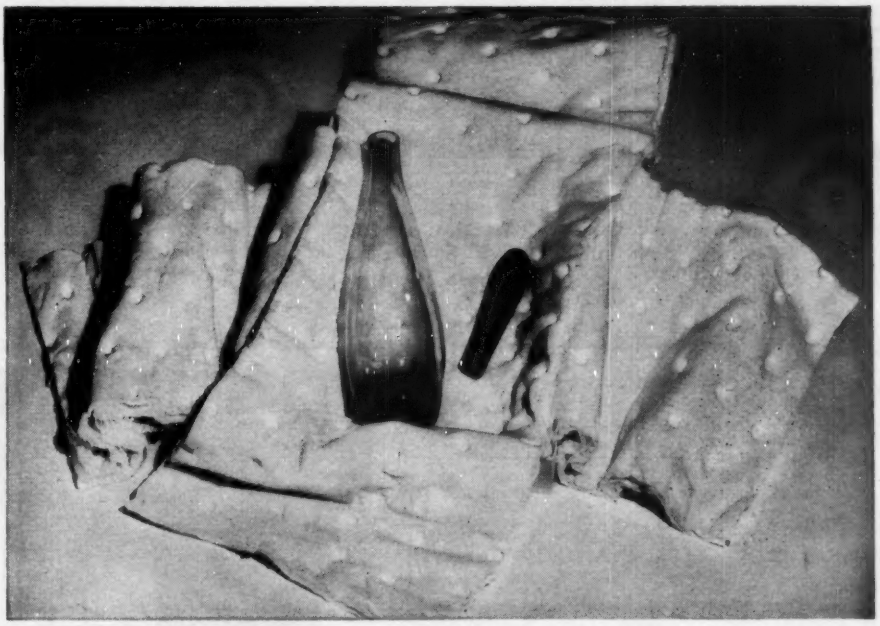
Soy fatty acids are the item under consideration. The purchaser knows that they are normally produced from foots or soap stock, an inferior grade of soy oil; therefore, he is rightfully suspicious of quality. He is using soy fatty acids to prepare 10 different alkyds; and each of these alkyds in turn is used in 10 end-product formulas. That means he will have to test 110 formulas. Obviously, a price incentive would have to be sufficient to support this effort and still leave some margin for savings.

As a corollary, once a supplier is established, the coatings manufacturer is reluctant to change; and is, therefore, apt to be a good customer. In any case, a $700-million market is one definitely worth cultivating.

REPRINTS AVAILABLE

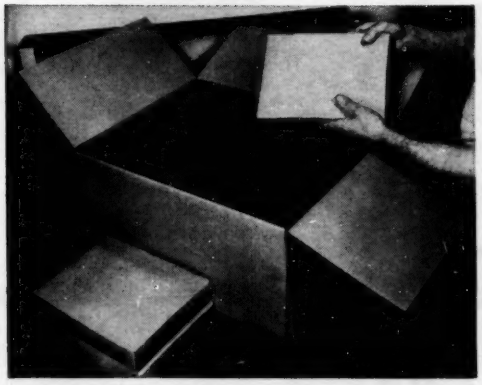
Copies of this report are available from Chemical Week, Reprint Dept., 330 W. 42nd St., New York 36, N. Y., at 50¢ each.

Prices for bulk quantities (over 10 copies) and for previous CW Reports are available upon request.



REPELLENT WADDING—The unique characteristics of Aquapel make it ideal for sizing grades like cellulosic cushioning materials, which have formerly presented difficult problems. A new concept in sizing, Aquapel reacts chemically with cellulose fibers to form a surface that is resistant to the penetration of water, acid, and alkali.

AQUAPEL® SOLVES THE TOUGHEST SIZING PROBLEMS



JUTE LINERS—Efficient sizing of alkaline jute liners for corrugated boxes has always been difficult to obtain. Now Aquapel makes it easy without sacrificing strength. A small amount of Aquapel provides a degree of resistance to moisture that keeps boxes looking better longer.

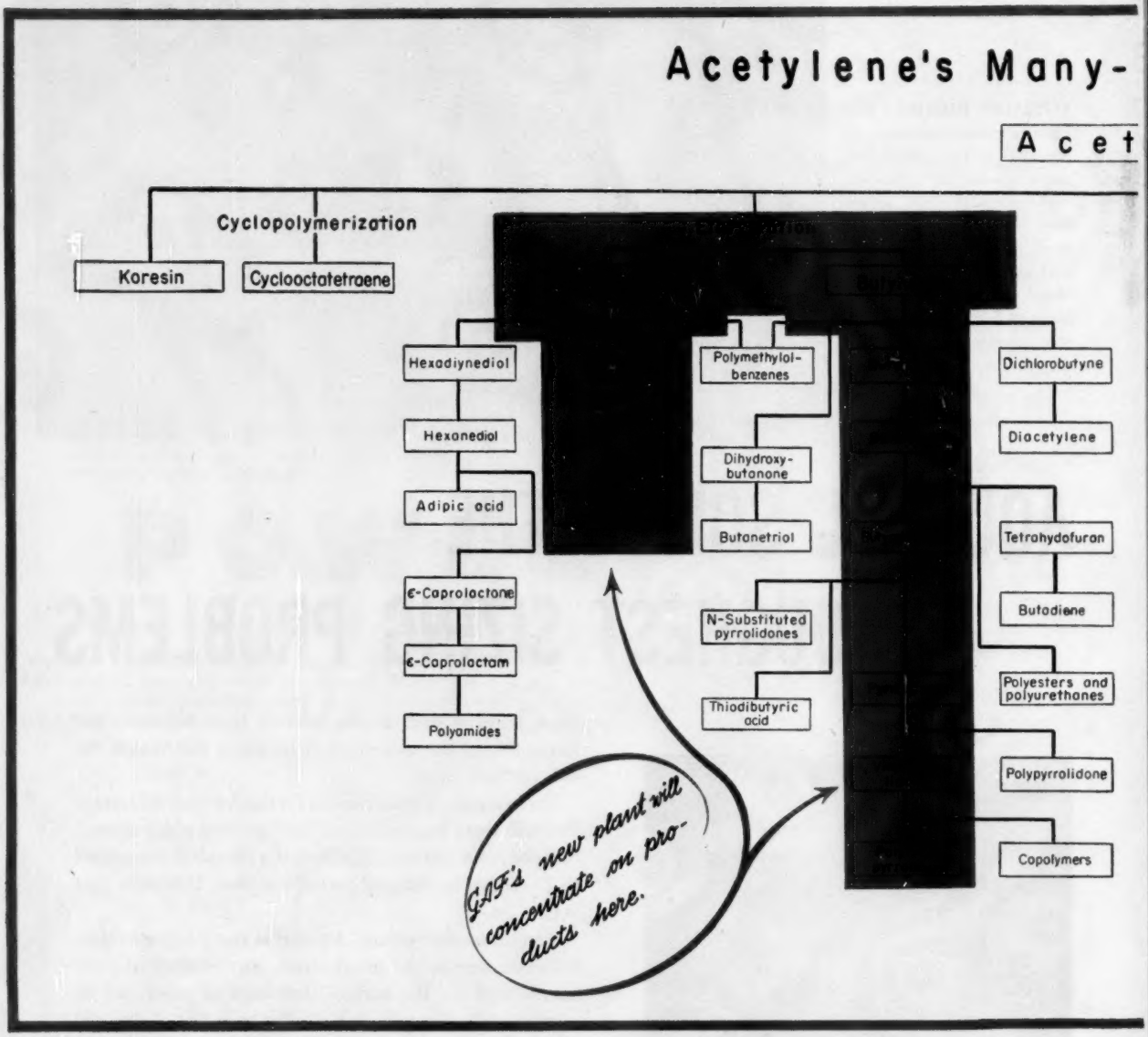
Impossible to size? If you haven't tried Aquapel, you haven't tried the new concept in sizing that makes the difficult look easy.

There are many good reasons for the Aquapel difference. To begin with, Aquapel is not just "another sizing agent." Neither resin nor wax, Aquapel is a chemical compound that becomes an integral part of the fiber. It is never just "stuck on."

Applied on the surface, Aquapel is also a lot more than a surface size in the usual sense. Any equipment commonly used for the surface treatment of paper can be used to apply Aquapel. And it takes only a little Aquapel to make a big difference.

If you haven't tried Aquapel, write Hercules for a sample and descriptive literature.

Paper Makers Chemical Department
HERCULES POWDER COMPANY
INCORPORATED
992 Market Street, Wilmington 99, Del.
PP56-2



The High-Pressure Harvest Begins

Years of careful cultivation are paying off for General Aniline & Film this week as the first commercial products issue from the company's recently completed $6-million plant at Calvert City, Ky. The crop: 10 chemicals produced by high-pressure reactions of acetylene.

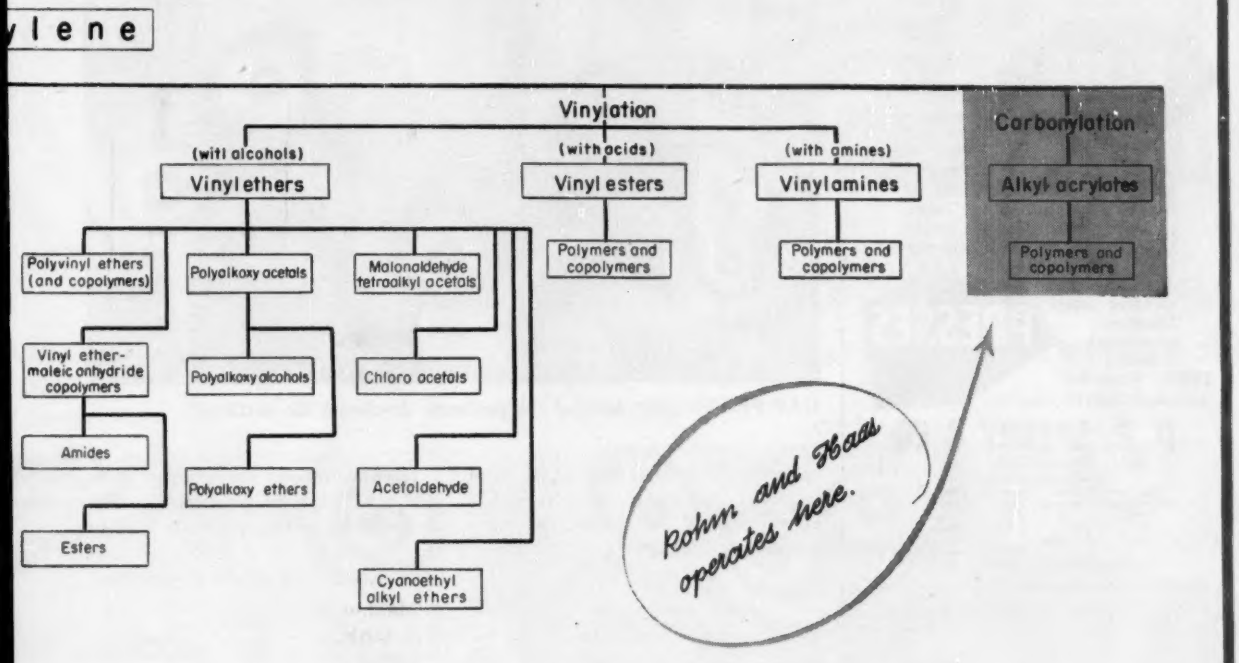
They're a small part of the total number of acetylene derivatives that GAF has explored.

All these products spring from the fertile soil of Reppe chemistry. Opened in the early '30s by Germany's Walter Reppe, it's characterized by four main reactions of acetylene—vinylation, ethynylation, carbonylation, and cyclopolymerization—at pressures up to 15 atmospheres and higher.

Most of the high-pressure acetylene work pioneered by Reppe (at I. G. Farbenindustrie) and GAF utilizes the ethynylation reaction, although Rohm & Haas uses an improved Reppe carbonylation to make acrylates.

Air Reduction (which supplies acetylene to GAF)—another factor in acetylene chemicals—is readying its Calvert City vinyl acetate monomer plant for full commercial production (probably by the end of the month). Airco's acetylene derivatives—vinyl acetate, tertiary acetylenic alcohols,

Branched Family Tree



ethynylcyclohexanols, etc.—are not, strictly speaking, Reppe chemicals. Most are produced at atmospheric or relatively low pressure over catalysts that differ considerably from the metal acetylides used by Reppe.

Says Airco: it's a question of economics—low-pressure processes are generally cheaper to design and operate.

And though the company has no current plans to enter the high-pressure field, it does not rule out that possibility for the future.

Carbide, which also has a big stake in acetylene, contemplates no immediate addition to its acetylene derivatives—vinyl chloride and acetate—made by low-pressure processes.

Harnessed Reactivity: Processing at GAF's plant starts with the reaction of acetylene with formaldehyde in the presence of a copper acetylide catalyst to yield propargyl alcohol (2-propyn-1-ol) and 2-butyne-1,4-diol. From the reactor, products pass through a separator, which removes unreacted acetylene for recycle, then to a stripping still for recovery of formaldehyde.

At this point, propargyl alcohol is taken off, sent either to product packaging or through further processing for conversion into propargyl halides. Butynediol is fed to a hydrogenation unit to form butanediol, which is then converted into butyrolactone by dehydrogenation.

After formation of the heterocyclic ring structure, butyrolactone is run into an amination unit, where it reacts with ammonia to yield 2-pyr-

SPERRY

For over 60 years SPERRY has originated or been closely identified with every major filtration development. That's why you can specify SPERRY with confidence —whether it's a standard or custom-engineered Filter Press of superior filtration and construction . . . one of Sperry's quality filter bases . . . a powerful Sperry Closing Device . . . or any Sperry labor-saving equipment—designed to solve your filtration problems —best!

FILTER PRESSES

FREE! Write for complete Sperry Catalog.

D. R. SPERRY & CO.

Batavia, Ill.

Sales Representatives:

George S. Tarbox, 808 Nepperhan Avenue, Yonkers, New York

Alldredge & McCabe, 847 E. 17th Ave., Denver 18, Colo.

B. M. Pilhashy, 833 Merchants Exchange Building, San Francisco 4, Calif.

Texco Chemical Engr. Co., 4101 San Jacinto, Houston 4, Texas

WISCONSIN ALUMNI RESEARCH FOUNDATION

PROJECT RESEARCH, CONSULTATION AND PRODUCTION CONTROL SERVICES

in

Biochemistry,
Chemistry,
Bacteriology,
and Pharmacology
Insecticide Testing
and Screening

Write for Price Schedule

WISCONSIN ALUMNI RESEARCH FOUNDATION

P. O. BOX 2059-H

MADISON 1, WISCONSIN

Story begins on p. 90

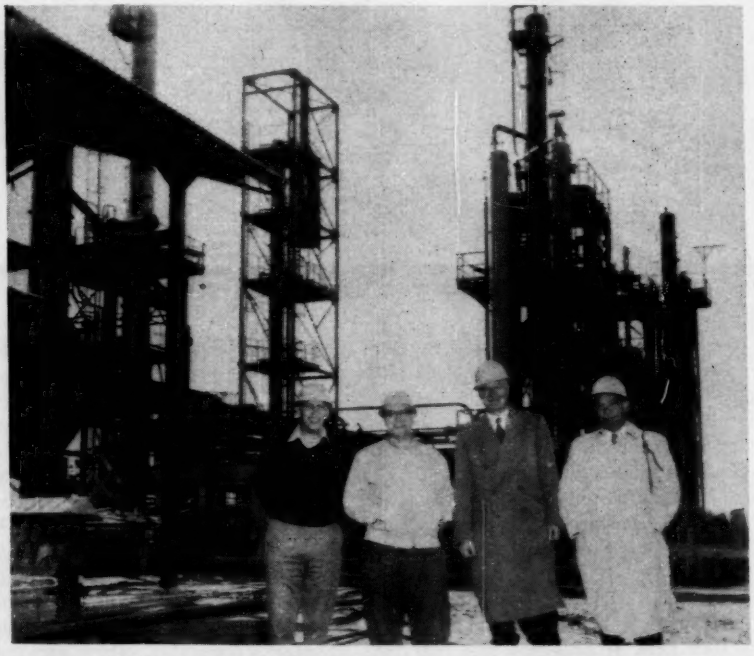
GAF PLANNERS* selected the products, developed the markets.

rolidone. This intermediate is then vinylated, and the resulting 1-vinyl-2-pyrrolidone is polymerized to polyvinylpyrrolidone (PVP).

Hard to Handle: The toughest problem GAF had to cope with in the design of its acetylene chemicals plant was instability of acetylene at high temperatures and pressures. On spon-

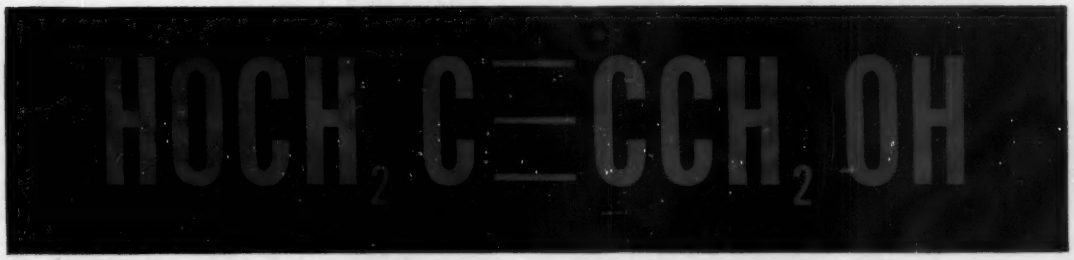
*Left to right, above: Acetylene Products Sales Manager Daniel Witwer, Antara Chemicals Division Manager Harold Shelton, Commercial Development Director Jesse Werner, Engineering Manager Fritz Wuerth, New Fields Research Manager Joseph Wilkinson.

†Left to right, below: Assistant Project Director O. W. Schnetzler, Project Director Wuerth, Dyestuff & Chemicals Division Vice President P. M. Dinkins, Plant Manager Hans Beller.



GAF DOERS† supplied the know-how that put Reppe chemicals onstream.

2-BUTYNE-1,4-DIOL



A BUILDING BLOCK AND CORROSION INHIBITOR

reacts as a glycol and a disubstituted acetylene

in synthesis — Replacement of OH ⟶ 1,4-Dihalo-2-butyne, $XCH_2C{\equiv}CCH_2X$
Isomerization ⟶ Hydroxymethyl vinyl ketone, $HOCH_2COCH{=}CH_2$
Alcohol addition ⟶ Alkyl ether of 1,4-Dihydroxy-2-butanone, $HOCH_2COCH_2CH_2OR$
Trimerization ⟶ Hexamethylolbenzene, $C_6(CH_2OH)_6$
Also hydrogenation, esterification, halogenation, hydration, etherification, etc.

as a corrosion inhibitor — Butynediol is effective alone or in blended formulations as a corrosion inhibitor for mineral acids, especially sulfuric acid.

other uses — Stabilizer for halogenated compounds. Chemical intermediate for pharmaceuticals, solvents, explosives, plasticizers, etc.

properties — Solid, m.p. 57.5° C, b.p. 140° C (1.0 mm.). Also available as a 35% aqueous solution.

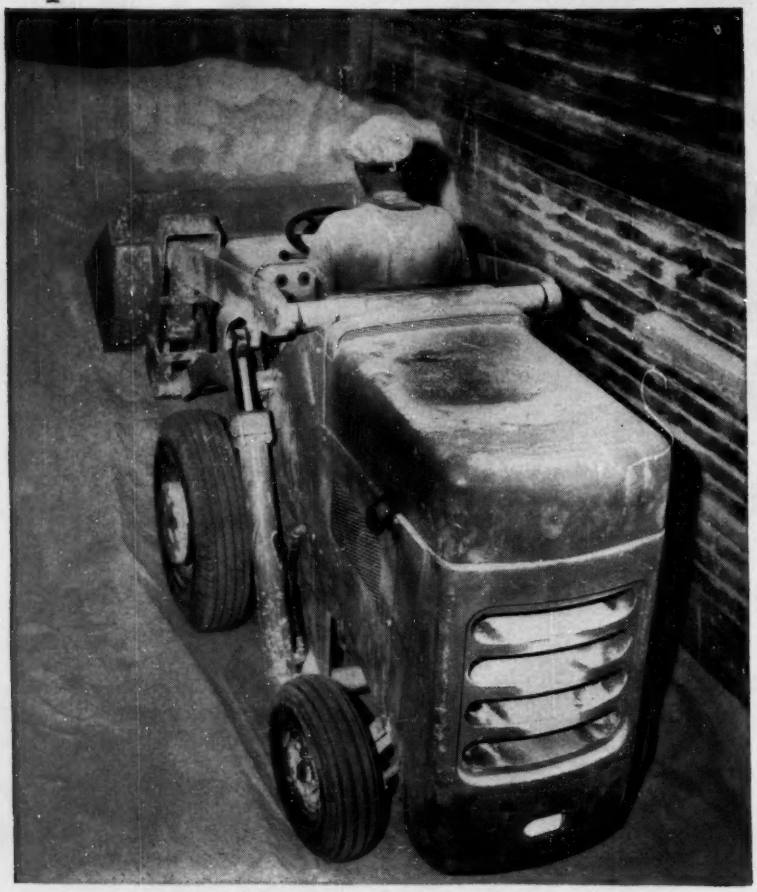
Now available in large commercial quantities from GAF's new high pressure acetylene chemicals plant

ANTARA gaf

ACETYLENE CHEMICALS DEPARTMENT
ANTARA® CHEMICALS
A SALES DIVISION OF
GENERAL ANILINE & FILM CORPORATION
435 HUDSON STREET · NEW YORK 14, NEW YORK

From Research to Reality

Report on the new **MICHIGAN 12B**



Power-shifting makes this new tractor shovel

faster and more maneuverable in boxcars and narrow aisles

If you've ever tried to shift gears and turn a corner at the same time, you'll understand why the new Michigan 12B is faster and more maneuverable in tight quarters. *You don't even have to stop to shift the 12B.* Without taking your left hand from the wheel, you simply push the single power-shift lever to High, Low or Reverse—instant shifting, just like a new car.

Speeds cycles. Clark's exclusive power-shift transmission and torque converter completely eliminate the clutch pedal and engine clutch; no gear clash, no hesitation. Power-shifting instead of a manual gear-shift saves valuable seconds on every cycle, in addition to eliminating down-time due to clutch trouble.

Dust protection. Oil bath air cleaner, filters and sealed assemblies protect the 12B against dust and dirt in every conceivable way. Take a first-hand look at this modern Tractor Shovel—clip the coupon to your letterhead and we'll arrange a demonstration in your own plant.

Available on Clark's no-down-payment Lease Plan; write for Data Sheet 111.

Michigan is a reg. trade-mark of

CLARK EQUIPMENT

Send details on the Michigan Model 12B

CLARK EQUIPMENT COMPANY
Construction Machinery Division
2459 Pipestone Road
Benton Harbor 3, Michigan

taneous decomposition, which may occur even in the absence of air, it liberates 54 kilocalories/mol. Such decompositions, if uncontrolled, produce an instantaneous pressure rise of up to 200 times the initial pressure of the gas.

Though no method has yet been found to prevent the decomposition under all conditions, two techniques are proving useful.

- When relatively low pressures are involved, simple dilution of acetylene with an inert gas (e.g., nitrogen, methane, propane) can maintain non-explosive conditions within the system.
- Where higher partial pressures are required, the dilution technique is not applicable and detonations can be controlled only by reducing the free space within the operating equipment.

The reduction of free space poses many unique problems, especially in the engineering of large-scale equipment. For one thing, it requires the use of small-bore pipelines, or the filling of process lines (larger than 1-in. diameter) with bundles of small tubes. Piping bends and all other free space within operating vessels must be subdivided into small voids by suitable fillers, such as steel Raschig rings.

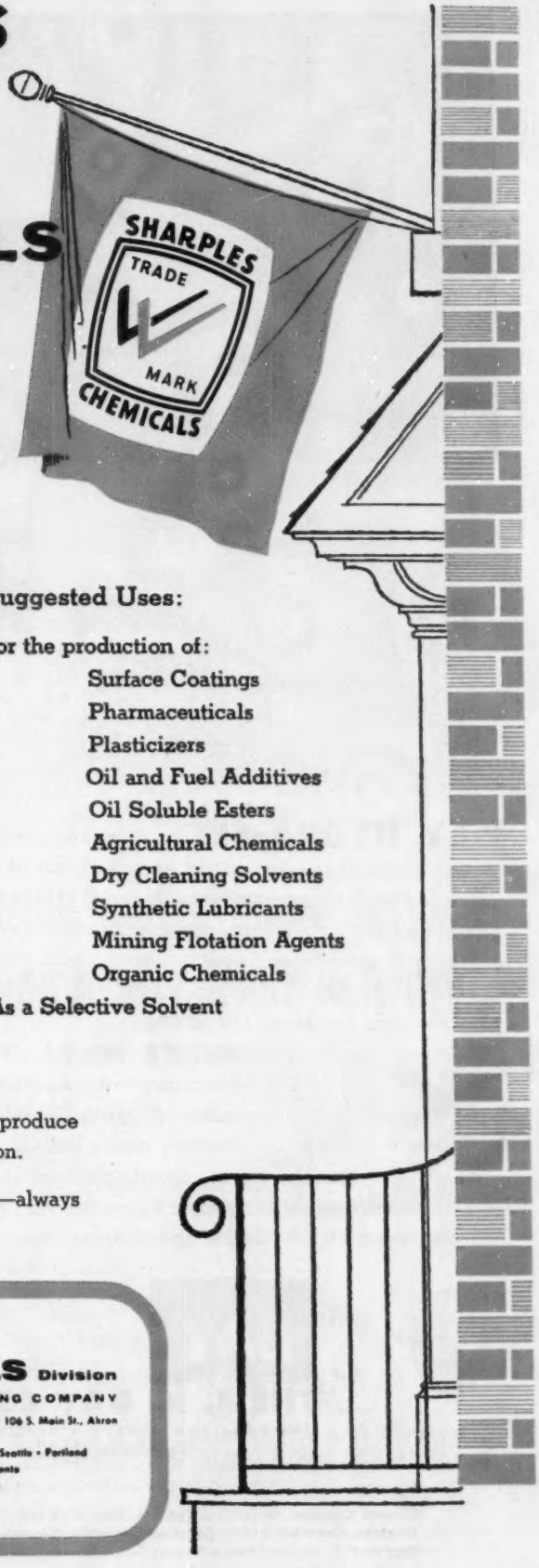
That this vital engineering problem has been solved is evident from the almost complete absence of explosion barriers at GAF's plant. In fact, the know-how so painstakingly acquired through the design and operation of the pilot installations enabled GAF engineers to complete the process engineering of the Calvert City plant in record time. Lummus handled the detailed design and construction. The entire job took only 19 months.

Built for Versatility: Unlike the German Reppe plant, which is, for the most part, a batch-processing system, GAF's facility features continuous operation. It's more flexible and it incorporates innovations—e.g., improved catalysts, novel use of infrared instruments and continuous gas stream analyzers—to step up yields and maintain high product quality.

As a result of this comprehensive planning, the plant requires relatively few operating personnel for a chemical operation of its size. Too, production can easily be switched from one product to another in response to shifting market demands.

Equal Building: In the final analysis,

HEADQUARTERS for SYNTHETIC AMYL ALCOHOLS



AVAILABLE IN BULK

PENTASOL

PRIMARY AMYL ALCOHOLS

SECONDARY AMYL ALCOHOLS

TERTIARY AMYL ALCOHOL

PENTANOL-1
n-Amyl Alcohol

PENTANOL-2
Methylpropylcarbinol

Suggested Uses:

For the production of:

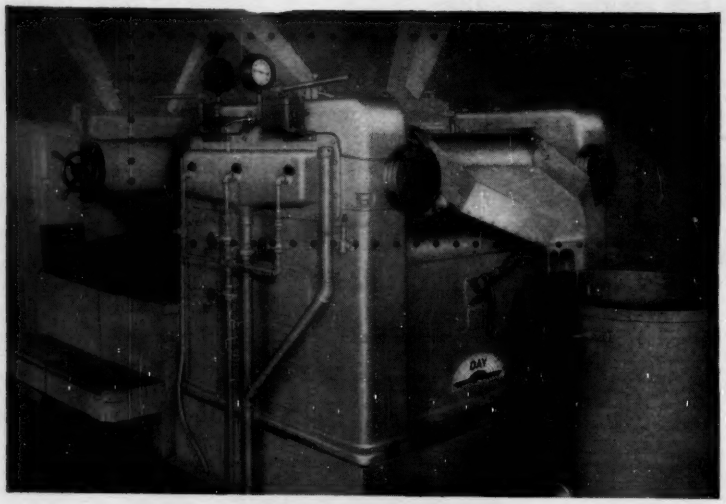
- Surface Coatings
- Pharmaceuticals
- Plasticizers
- Oil and Fuel Additives
- Oil Soluble Esters
- Agricultural Chemicals
- Dry Cleaning Solvents
- Synthetic Lubricants
- Mining Flotation Agents
- Organic Chemicals

As a Selective Solvent

In addition to the alcohols listed above, we can produce other isomers and blends tailored for your application.

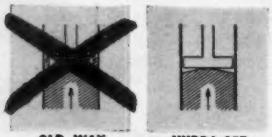
Call or write Sharples for synthetic amyl alcohols—always available.

SHARPLES CHEMICALS Division
PENNSYLVANIA SALT MANUFACTURING COMPANY
Pennsalt Chemicals
500 Fifth Ave., New York • 80 E. Jackson Boulevard, Chicago • 106 S. Main St., Akron
Executive Office: Philadelphia, Pa.
Martin, Hoyt & Milne Inc., San Francisco • Los Angeles • Seattle • Portland
Shawinigan Chemicals, Ltd.: Montreal • Toronto
Airco Company International, New York



guessing... games... are... over...

DAY HYDRA-SET... a unique hydraulic roll-setting device that takes all the guesswork out of roll settings . . . developed by DAY engineering, field tested with spectacular results. One simple setting gives unvarying accuracy to your roll mill work, resulting in absolute uniformity of every batch of pigmented product. With the DAY Hydra-Set your roll position is absolutely constant once you make the setting.



OLD WAY HYDRA-SET

HERE'S WHY: The Day Hydra-Set incorporates a sealed hydraulic cylinder. A synthetic rubber diaphragm prevents piston leakage, thus maintaining constant pressure at all times.

DAY Hydra-Set comes as optional equipment on new mills or as a field conversion kit. Write for Specification Sheet I-400 R.M.

in roller mills FOUNDED 1887 DAY *means longer life span*

THE J. H. DAY COMPANY
INCORPORATED
1150 HARRISON AVENUE • CINCINNATI 22, OHIO

Quality equipment for baking, paint and varnish, printing ink, chemical, rubber, pharmaceutical, cosmetics, paper and pulp, explosives, food, ceramics, candy, soap, sugar and milk products.

Eastern Canada: Brantford Oven & Rack Co., Ltd., Brantford, Ontario
Western Canada: British Canadian Importers, Vancouver, British Columbia
Mexico: T. de la Pena e Hijos, S.A., Nazas 45-A, Mexico 5—D.F.

GAF's intensive marketing effort rates equal billing with its engineering achievements in the story of high-pressure acetylene chemistry.

In on the development from the start, the market development team sifted out the group of products with the best chances of commercial success, found enough outlets to justify the company's jump into large-scale production.

Front-runner of the 10 new products, for the moment at least, is polyvinylpyrrolidone (PVP).

Known primarily as a blood volume expander, this compound is finding use in agriculture, cosmetics and pharmaceuticals.

Close cooperation between the marketing and engineering teams continues as GAF explores other reactions and products of Reppe chemistry. And with several vinylation products already at the pilot stage, the high-pressure harvest could, with luck, become a bumper crop.

Bouncing Out Waste

Pollution fighters gained a new weapon last week as Chevrolet Motor Division of General Motors (Tonawanda, N. Y.) unveiled a new waste treatment system for removing foreign solids from liquid wastes.

Extracting 99.8% of the clays, coal and graphite washed from foundry sand, the process literally "bounces" nearly 50 tons of dirt from the water discharged daily into the Niagara River.

Fundamentally, the antipollution method consists of two phases: most of the foreign matter is made to sink; then the procedure is reversed and the remainder is induced to float.

Heavy particles are first allowed to settle in one of two large sedimentation tanks. After 90% of the solids have settled, some of the water is recirculated to the washing operation, while the excess passes on to a large clarification tank.

Fine particles that escape the settling step are thickened into a sludge, pumped to a holding basin in the waste treatment building. Final cleaning is achieved by the addition of chemicals and air, which cause residual fines to agglomerate and float.

Chevrolet declares the bounce technique is so effective that effluent is often cleaner than the river itself.

Wyandotte's Royce Buck talks over chlorine requirements with Vice President Robert B. Jones.

"With Wyandotte quality chlorine and prompt service we give customers product uniformity, fast delivery"

— says Robert B. Jones, vice president, John Wiley Jones Co., Caledonia, New York

"Back in 1931, when the John Wiley Jones Company started to manufacture sodium hypochlorite bleach, there was a big need for cylinder delivery of liquid chlorine," relates Robert B. Jones, vice president.

"Realizing the tremendous potential, our company took on the job of packaging chlorine and making delivery — via containers — to installations all over the world. The very nature of the business requires that we give uniform quality and fast delivery — and we can, thanks to Wyandotte's product excellence and prompt delivery.

"We have spent years in the job of controlling the taste and purity of water. Packaging chlorine in convenient, safe containers, we've been responsible for the health protection of millions of people in the U.S. and 23 foreign countries . . . some as far away as Arabia, Iran, and Venezuela.

"In order to give good service to these countries, we have to work very closely with our suppliers. For the past 25 years, Wyandotte has filled our needs for chlorine, and we have often called upon them for research and technical assistance."

Are you looking for a source of supply to meet your own chemical needs? If you are, investigate Wyandotte's services, technical assistance, and high-quality chemicals. Call in a Wyandotte representative today, and let him show you how you can benefit from dealing with Wyandotte — a leading supplier of quality chemicals for over 65 years. Or write: *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Offices in principal cities.*

Wyandotte CHEMICALS

MICHIGAN ALKALI DIVISION
HEADQUARTERS FOR ALKALIES

P.S. Our fact-packed new book on Wyandotte Chlorine describes uses, properties, chemical reactions, unloading, safety precautions. 96 pages, 50 illustrations, 20 tables, charts, diagrams. Indexed. Supply limited. Write on company letterhead for your copy.

PANELISTS (left to right) Krase, Jelen, Weaver, Wessel, Reilly, Wager swap views on process cost control during . . .

Interlude in the Sun

The smog in Los Angeles withdrew last fortnight, spilling down California sunshine on 750 chemical engineers who converged on the Hotel Statler for the 33rd national meeting of American Institute of Chemical Engineers.

But by the time the engineers got around to discussing air pollution—the last session on Wednesday, the meeting's last day—the smog was cautiously feeling its way back into town. In the time between, the Los Angeles meeting dealt primarily with applications of machine computation, study and control of fast reactions (*CW Technology Newsletter, March 10*), and the supervision of engineering and scientific personnel.

Accent on Economics: But the session that generated the most interest, particularly for engineering management, was the one on Tuesday led by International Minerals' Henry Wessel and devoted to economic techniques of justifying process industry projects.

Following this was the only informal gathering of the three-day meeting—a luncheon at which the featured speaker was Charles (Pete) Neidig, general partner of White, Weld and Co. (Philadelphia). His topic: "Is capital really tight in the chemical process industry?"

Neidig discussed the financial structures of some major chemical companies, concluded that if you have a good project, you can always get money for it.

Thanks largely to the morning speakers, he found a receptive audience for his talk. This is what preceded Neidig:

• Hamilton Wager, of Arabian-American Oil Co., spoke on the need for formalized systems in smoothing the flow of communications in requests for new capital appropriations. Specifically, he described the "appro-

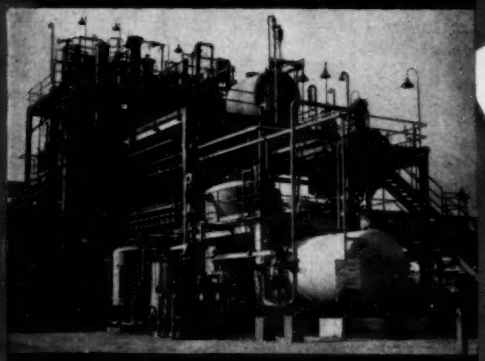
NEIDIG: For luncheon guests, a special course—chemical financing.

AT THE FINISH: Despite agreement, plugs for pet theories.

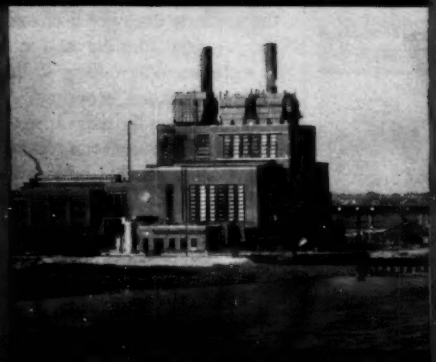
DROP FORGED STEEL

valves, fittings and flanges by Vogt

REFINERIES



CHEMICAL PLANTS



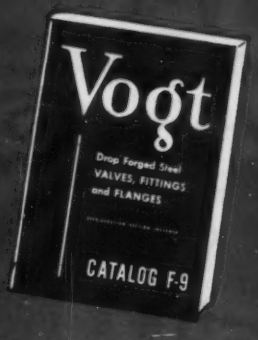
POWER PLANTS

USED and TRUSTED by the NATIONS KEY INDUSTRIES

There are good reasons behind the trust which America's key industries have placed in Vogt valves, fittings, and flanges for half a century. They know that *drop forged materials* are uniform in structure, fine grained, and free from porosity. They know, too, and appreciate the meticulous care given these products through every stage of forging and machining in Vogt's modern shops, and about the many rigid tests and inspections. And that is why these products enjoy such an impressive record of performance in withstanding the shocks and stresses imposed by high or low pressures and temperatures and in resistance to erosive and corrosive conditions.

Service is another important factor in this confidence because Vogt maintains the world's largest and most complete stock of drop forged steel valves, fittings, and flanges always ready for immediate shipment.

Write for Catalog F-9. Consult its 400 pages for the complete Vogt line of drop forged steel valves, fittings, and flanges for oil, steam, water, air, gas, and refrigeration services. Address Dept. 26-FCW



HENRY VOGT MACHINE CO. 75th Anniversary LOUISVILLE, KY.

HENRY VOGT MACHINE CO., LOUISVILLE, KY.

BRANCH OFFICES: New York, Philadelphia, Chicago, Cleveland St. Louis, Dallas, Charleston, W. Va., San Francisco

having problems with your present low-molecular weight fatty acid?

then try

Emfac®
Pelargonic Acid!

Because of its odd-carbon length, pelargonic acid acts differently in many instances from low-molecular weight fatty acids occurring in nature. That's why pelargonic acid may give your end product just the exact property you have been striving to attain. Or...it may be the answer to a possible difficult problem of melting point, stability, or solubility. Whatever it be, send for an evaluation sample of unusual, Emfac 1202 Pelargonic Acid and see if it can give your product competitive advantages.

Here's where it fits in the commercial low molecular-weight series of fatty acids.

	Caprylic	Pelargonic	Capric	Lauric
Carbon Atoms	8	9	10	12
Molecular Weight	144	158	172	200
Titer, °C	12	10	30	42
Melting Point, °C	16	8	31	43
Boiling Point, °C at 760 mm.	238	255	270	299
Iodine Value	1	nil.	1	1
Acid Value	390	350	325	280

Mail coupon today for descriptive literature.

Emery

Fatty Acids & Derivatives
Plastolein Plasticizers
Twitchell Oils, Emulsifiers

Emery Industries, Inc., Carew Tower, Cincinnati 2, Ohio
New York · Philadelphia · Lowell, Mass. · Chicago · San Francisco · Cleveland
Warehouse stocks also in St. Louis, Buffalo, Baltimore and Los Angeles
Export: Carew Tower, Cincinnati 2, Ohio

Emery Industries, Inc.
Dept. I-3, Carew Tower
Cincinnati 2, Ohio

Please send descriptive literature on Emfac 1202 Pelargonic Acid.

Name.....Title.....

Company.....

Address.....

City.....Zone....State.....

priations request," what it should contain and some of the things to look for and look out for.

• Allied's Frederic Jelen aired one of his pet themes—capitalized costs as a means of comparing alternatives.

Briefly, the problem he discussed is this: a company is faced with the alternative of investing in an equipment replacement "A," immediately, or waiting and investing in a different item, replacement "B," later on.

Since money has a value that varies with time, and since the two potential replacements have different service lives, the problem is not simple.

Jelen's solution: reduce both "A" and "B" to a common cost in terms of money. Then by figuring a replacement of both "A" and "B" by themselves, for an indefinite period, you can arrive at figures that essentially reduce both to a common denominator.

One point he made in the question-and-answer session: to use the system, you must have a firm idea of the service life. Said he, "If you don't, you are not only a bad financier, you're a bad engineer as well."

• Brea Chemicals' Jack Tielrooy stressed the importance of preparing complete and accurate capital cost estimates when making initial economic evaluations.

He examined the return on investment of 10 large chemical companies, found that they vary tremendously. He points out that new ventures often do not live up to glowing advance estimates, concludes that this is because the estimate does not take into account the required number of factors.

• James Weaver and Robert Reilly, of Atlas Powder, proposed a relatively new concept in measuring the economic attractiveness of a new venture. They point out that both conventional methods—return on investments or payout periods—leave something to be desired.

"One dollar invested today that returns $2 by nightfall," they state, "is a better investment than one that returns $2 a year from now. Yet both give the same return on investment.

"Similarly, $1 invested today that returns $2 by nightfall, and no more, is not as good an investment as $1 that yields $2 today and two more every day for the rest of the year. Yet both have the same payout period."

They proposed an "interest rate of

"You can say that again"

Thomas Phillips is a Big Name in small bags..

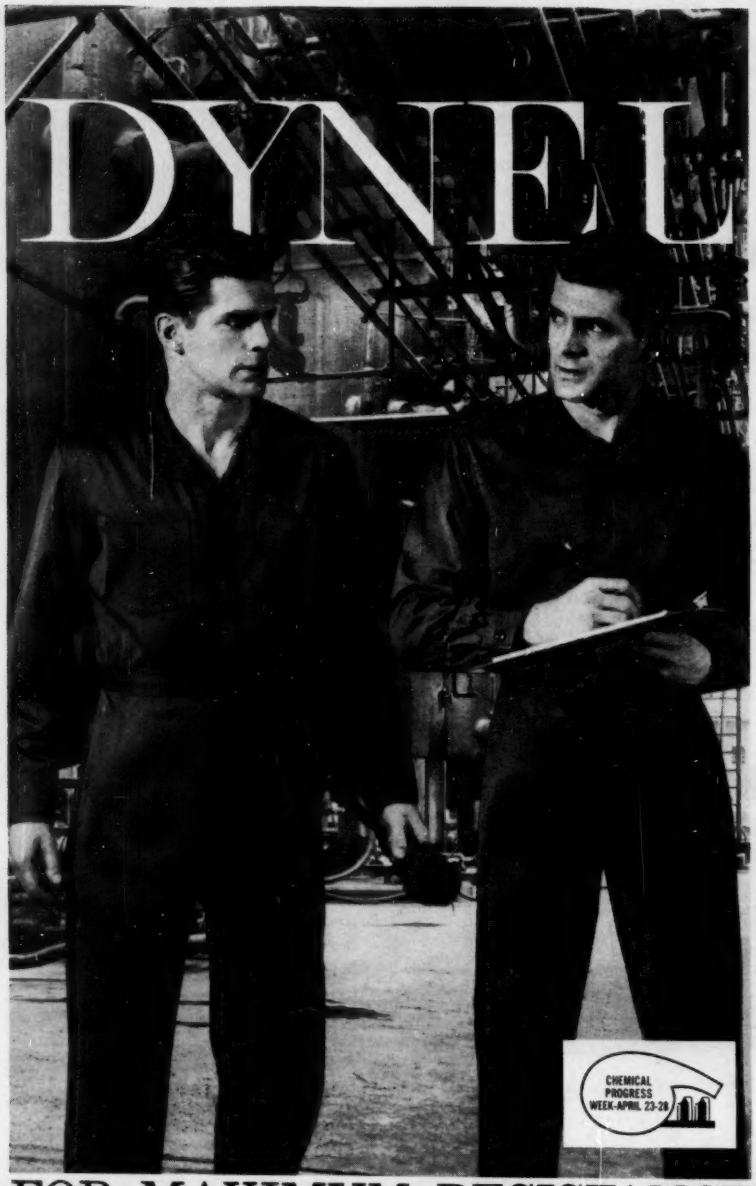
THE design and manufacture of smaller paper bags — from 2 to 50 lbs. capacities — has been a big part of the business of Thomas Phillips for 84 years. Single, duplex or multiwall . . . self-openers . . . flat or satchel bottoms . . . open mouth or valve . . . poly-coated or special paper . . . for flour, grain, fertilizers, insecticides, seed, paint, dog food — anything that can be bagged.

Thomas Phillips, too, is an integrated mill — from pulp to finished product — making much of our own special paper. Our composition rope kraft, or coated blue lined flour bag paper, is one of the softest and most porous available today. And, we maintain complete art, plate and printing departments to assure you the finest reproductions possible.

There is a difference in bags . . . and service after sale . . . so why not place a trial order with Thomas Phillips.

Remember, too, that Thomas Phillips is a leading producer of multiwall bags up to 100 lbs. capacity, and we will ship in mixed car lots to suit your production schedules.

THOMAS PHILLIPS COMPANY • AKRON, O.



FOR MAXIMUM RESISTANCE
to chemicals, wear and laundering
IN WORK CLOTHES

Wide use proves that work clothing made of DYNEL often lasts four or five times longer than comparable garments made with traditional fibers. DYNEL is unaffected by most chemicals; can be washed, dry cleaned or decontaminated in acids without harm; will not support combustion; retains strength wet or dry. Write for list of manufacturers.

DYNEL • Union Carbide and Carbon Corporation UCC 30 East 42nd Street, New York 17, N. Y.

PRODUCTION . . . . .

return" yardstick in which the "interest rate" represents the rate at which money could be borrowed to finance the new project and just break even. As they see it, their system is an accurate measure of the earning power of invested capital.

• Norman Krase, of Du Pont, concerned himself with the other side of the coin: When should a company discontinue operating investments?

One criterion, of course, is to compare an estimate of its future earnings with the earnings that would come from sinking the recovered capital into new investments. He also suggested applying to the older operating investment a "test return" that takes into account the purely financial consequences of a list of financial factors.

Yes and No: All the engineers present didn't agree with everything said by all of the speakers, of course. But the consensus was that the ideas put forth were stimulating, refreshing —a conclusion substantiated by the healthy attendance, particularly at the cost session.

EQUIPMENT . . . .

Conductivity Control: Fielden Instrument Division of Robertshaw-Fulton Controls Co. (Philadelphia) is out with a new electronic device for controlling solution conductivity. Equipped with two-zone action for both alarm and control, the unit comes in conductivity ranges of 0-30 and 20-200 micromhos/cubic cm., for use with cells having a constant of 1.

•

Switching Control: Vapor Recovery Systems Co. (Compton, Calif.) offers its new Varec pneumatic level control for actuating equipment used in tank switching systems. Two models provide either high- or low-level control, mount on standard gauges.

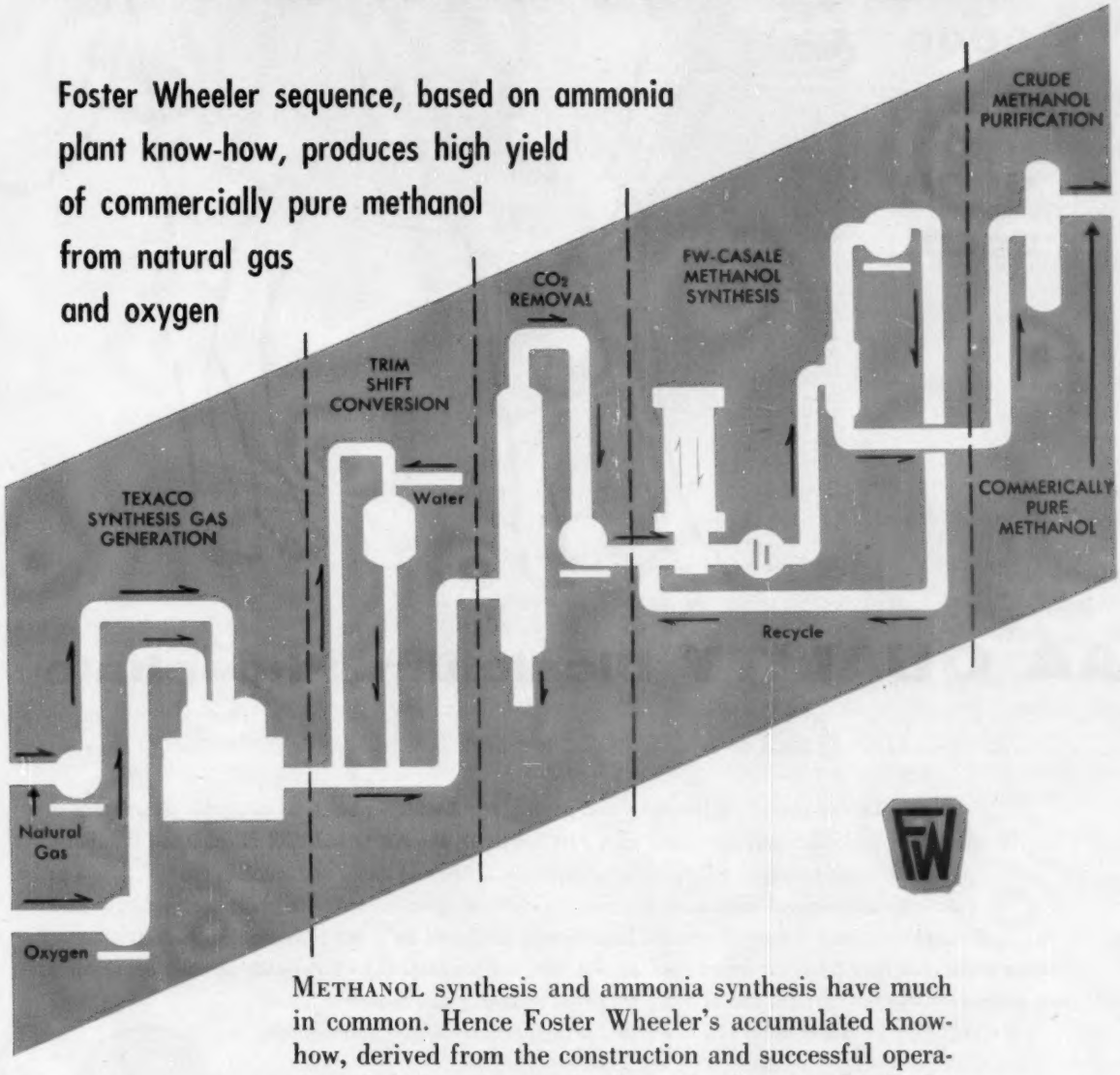
Both types are cam-triggered, operate at any float position within a range of 24 ft.

•

Valve Covers: To simplify the stocking of numerous sizes of valve covers, Neirad Industries, Inc. (Darien, Conn.) offers its new universal line of Spray-Stop covers, which replaces the 142 sizes previously required. Used to prevent sudden leaks from jetting onto personnel and equipment, they're made in Teflon, leak-indicating and non-indicating materials.

methanol

Foster Wheeler sequence, based on ammonia plant know-how, produces high yield of commercially pure methanol from natural gas and oxygen

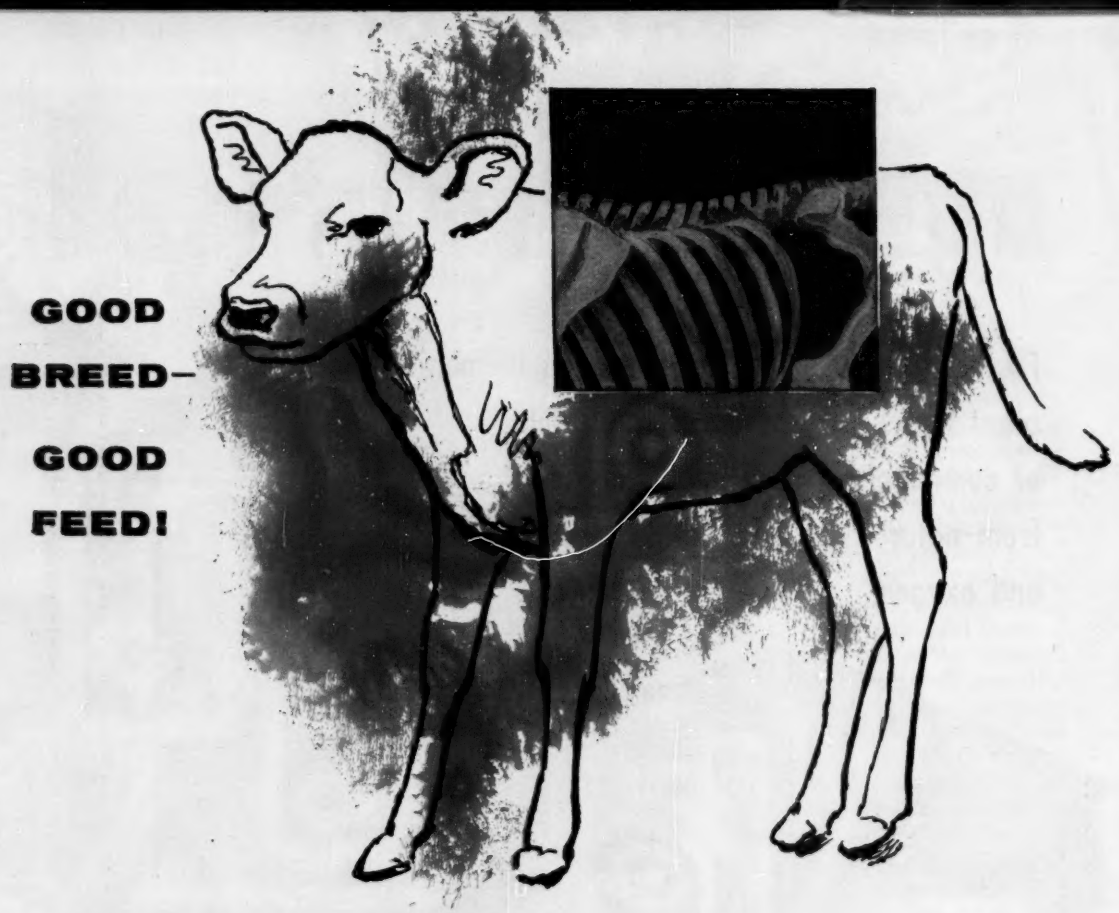


METHANOL synthesis and ammonia synthesis have much in common. Hence Foster Wheeler's accumulated know-how, derived from the construction and successful operation of six large ammonia plants, is of great value in the planning and construction of modern methanol units. The FW sequence for production of commercially pure methanol is shown above.

For further details on this FW sequence, write to *Foster Wheeler Corporation, 165 Broadway, New York 6, N.Y.*

FOSTER WHEELER

NEW YORK • LONDON • PARIS • ST. CATHARINES, ONT.



AA QUALITY Dicalcium Phosphate

...builds better bones—and bigger profits

Heavier producing livestock and poultry require higher levels of inorganic phosphorus—economically and efficiently furnished with PHOS-FEED, the AA QUALITY Dicalcium Phosphate, high in bone-building, cell-building phosphorus (18½ and 21%) and calcium (25%) . . . low in fluorine (guaranteed maximum 40 ppm). Made from lime treated with phosphoric acid . . . acid derived from 99.9% pure Elemental Phosphorus, produced by A.A.C. Co. electro-thermal process, using phosphate rock from our own mines. Dependable service assured by large-scale production. Quality and uniformity assured by rigid test at every stage of processing. See complete list of AA QUALITY products listed below—write for further information and samples.

"From our mines to your plant"

THE AMERICAN AGRICULTURAL CHEMICAL COMPANY

Chemical Division: 50 Church Street, New York 7, N. Y. • 30 plants and offices serving U. S., Canada, Cuba

AA QUALITY PHOSPHORUS PRODUCTS

PHOSPHORUS AND PHOSPHORUS COMPOUNDS
Elemental Phosphorus (Yellow-White)
Phosphorus Red (Amorphous)
Phosphorus Pentasulphide • Sesquisulphide
Ferro Phosphorus (Iron Phosphide)

PHOSPHATES
Disodium Phosphate • Trisodium Phosphate
Dicalcium Phosphate • PHOS-FEED® BRAND

PHOSPHORIC ACID
85% N. F. Grade • 75% Pure Food Grade
50% Pure Food Grade
Agricultural and Other Grades

PHOSPHATE ROCK & FERTILIZERS
All grades Florida Pebble Phosphate Rock
Superphosphate
Complete Fertilizers

OTHER AA QUALITY PRODUCTS

FLUORIDES AND SILICOFLUORIDES
Sodium Fluoride • Ammonium Silicofluoride
Magnesium Silicofluoride
Potassium Silicofluoride
Sodium Silicofluoride • Zinc Silicofluoride
Silicofluoride Mixture
Ammonium Fluoborate
Aluminum Fluoride
Magnesium Fluoride

GELATIN
KEYSTONE® Gelatin: Edible, Photographic, Pharmaceutical, Technical

OTHER PRODUCTS
Animal Bone Charcoal
Bone Black Pigment (COSMIC® Blacks)
Keystone Ammonium Carbonate
Sulphuric Acid • Insecticides-Fungicides

Technology

Newsletter

CHEMICAL WEEK

March 17, 1956

Citric acid is aspiring to a sizable new market as a sequestering agent in secondary oil recovery. Data supporting the effectiveness of the chemical in boosting petroleum yields was disclosed this week by Pfizer's Paul Weber and Kenneth Shaw at the National Assn. of Corrosion Engineers meeting (New York).

What the citric acid does is curb iron-precipitation (one of the main causes of underground stoppages) by preferentially sequestering iron. The big advantage of citric: its selectivity permits its use in low concentrations (e.g., 10 ppm. or roughly 1 lb./12,000 gal. of water).

Other sequestering agents—polyphosphates, ethylenediaminetetra-acetic acid (EDTA) etc.—first sequester other metals (e.g., calcium, copper), become uneconomical in areas where calcium runs as high as 30,000 ppm. With water-flooding becoming more and more important in such areas, citric's selectivity could be worth plenty to manufacturers of the chemical (Miles Laboratories and Stauffer, in addition to Pfizer and others).

Although some may question the economics of pumping a chemical selling for about 28-30¢/lb. into a hole in the ground, the practice is said to make sense to oil men who have observed field tests over the past three years. In Illinois, report Weber and Shaw, it has substantially improved the yield of secondary-recovery operations, which amounted to 5,690,000 bbls. of oil from 7,200 flooded acres during the 3-year period that the technique has been employed.

•

A note of warning on food preservation by irradiation was sounded by AEC's Willard Libby at recent Congressional atomic hearings. In answer to criticism that AEC is moving too slowly in this field, Libby emphasized the need for caution, stated that it will take years to learn the physiological effects of continued consumption of irradiated food, and to develop adequate federal controls.

To this end, the government this year will spend $1.5 million for research. And AEC is seeking an additional $3 million for a special reactor to test food-irradiation processes.

•

Other government appropriations earmarked for research in the budget for fiscal 1957:

- $23,749,000 for mental illness research—with emphasis on evaluation and development of tranquilizing drugs.
- $34,437,000 for cancer study, especially in virology and chemotherapy.
- $25,106,000 for heart disease, with special attention to drugs for controlling arteriosclerosis and hypertension (*CW, March 3, p. 62*).
- $6,375,000 for U.S. Public Health Service's turberculosis program, which includes further work on the use of isoniazid as a TB preventive.
- $6 million for sanitary engineering facilities. This is a $1,310,000 increase over the amount budgeted for fiscal 1956, thanks largely to the intensified attack on air pollution authorized by Public Law 159 (enacted last year).

And these are funds approved only by the House, which inclined to give some agencies more than they requested. The Health, Education & Welfare Dept., for example, asked for a total of $126,525,000, received a boost of $9 million. The budget will now go to the Senate Appropriations Committee, a group that has rarely missed an opportunity to hike appropriations for medical research or food and drugs.

Technology Newsletter

(Continued)

M. W. Kellogg last week delivered its long-awaited decision on the Oregon Forest Products Lab process of extracting wax from Douglas fir bark (*CW Technology Newsletters, Dec. 31, Jan. 21*)—and the answer is "No."

After 4 years of researching, pilot-planting, and test-marketing the wax, Kellogg did not renew the option and royalty agreement, which had been extended to March 7. This leaves Oregon's state forestry board free to negotiate with other chemical producers who have shown interest in the process.

Reasons for Kellogg's action won't be known until it submits its final report to the Oregon board in 4-6 weeks. Economics, rather than technology, probably was the deciding factor. For one thing, the variable price of competitive carnauba wax made the fir bark product's market position questionable. Too, the pressure on Kellogg to put its idle dollars to work is not as great as it was prior to its recently announced entry into the polyethylene field (*CW, Feb. 25, p. 98*).

•

Ohio Oil Co. in association with Arthur Pew of Philadelphia will push pilot-plant development of a process to extract uranium from lignite. The pilot plant will be operated by Catalytic Construction.

Lignite has been known to contain uranium for some time. Some deposits in the Dakotas run up to 0.4% uranium. But so far, an economical means of extraction has been lacking. National Lead has been working on the problem for the Atomic Energy Commission. Though progress has been reported as satisfactory, the solution has not yet been reached.

AEC has told Pew and Ohio Oil that it is willing to negotiate a contract to buy some of the uranium.

•

The Bureau of Mines may revamp and reactivate its Albany, Ore., pilot plant for making zirconium.

The operation has been closed down since Carborundum started up its production plant. But the Atomic Energy Commission's needs have been running ahead of the plant's capacity, and AEC has asked how long it would take to get the 300,000-lbs./year facility back into operation. The bureau reports that it would take approximately three months. Some of the equipment is all set, but components of the plant have been sold, some have been dismantled. In addition, some of the skilled operating crew are no longer available.

•

Hooker Electrochemical is out with research quantities of four new chlorofluorocarbons based on its hexachlorobutadiene and hexachlorocyclopentadiene: 2,3-dichlorohexafluorobutene-2; 1,2-dichlorohexafluorocyclopentene-1; 2, 2, 3, 3-tetrachlorohexafluorobutane; and 2, 2, 3-trichloroheptafluorobutane. They're being groomed for a variety of jobs, principally in making resins and as refrigerants.

•

A new forming machine is quietly being put through its paces by its inventor, Aldan Simpson, at Bound Brook, N.J. It feeds on fibrous materials, produces a mat that can be impregnated with resins during the process. A larger model has been made for test purposes by Noble & Wood Machine Co. (Hoosick Falls, N.Y.), which is now building other units for commercial applications. Some of the firms that have placed orders are Trimount Plastics (Arlington, Mass.), Standard Tube (Detroit) and American Brake Shoe.

*Trade-mark of Borax Consolidated, Limited

Boron Tree

chemists—research scientists...

Here are your boron tools for research. Their diversification is great enough to spur imagination. Some of you have used Boron for petroleum additives... nuclear development... high temperature metals. You know its value to hundreds of other useful, though more prosaic, products such as washing powders, glassware and china. And we, as borate specialists, continue to put forth more growth on our "Boron Tree" in order that you may expand your research activities unhampered by lack of suitable boron chemicals.

Pacific Coast Borax Co.
Division of Borax Consolidated, Limited
Product Development Department CW
100 Park Avenue, New York 17, N.Y.

Please send technical data sheets

name_____

firm_____

address_____

city_____ state_____

(Please attach coupon to your business letterhead)

Pacific Coast Borax Co.
Division of Borax Consolidated, Limited
630 Shatto Place, Los Angeles 5 • 100 Park Ave., New York 17

MANUFACTURERS OF FAMOUS "20 MULE TEAM" PACKAGE PRODUCTS

Technology Newsletter

(Continued)

M. W. Kellogg last week delivered its long-awaited decision on the Oregon Forest Products Lab process of extracting wax from Douglas fir bark (*CW Technology Newsletters, Dec. 31, Jan. 21*)—and the answer is "No."

After 4 years of researching, pilot-planting, and test-marketing the wax, Kellogg did not renew the option and royalty agreement, which had been extended to March 7. This leaves Oregon's state forestry board free to negotiate with other chemical producers who have shown interest in the process.

Reasons for Kellogg's action won't be known until it submits its final report to the Oregon board in 4-6 weeks. Economics, rather than technology, probably was the deciding factor. For one thing, the variable price of competitive carnauba wax made the fir bark product's market position questionable. Too, the pressure on Kellogg to put its idle dollars to work is not as great as it was prior to its recently announced entry into the polyethylene field (*CW, Feb. 25, p. 98*).

•

Ohio Oil Co. in association with Arthur Pew of Philadelphia will push pilot-plant development of a process to extract uranium from lignite. The pilot plant will be operated by Catalytic Construction.

Lignite has been known to contain uranium for some time. Some deposits in the Dakotas run up to 0.4% uranium. But so far, an economical means of extraction has been lacking. National Lead has been working on the problem for the Atomic Energy Commission. Though progress has been reported as satisfactory, the solution has not yet been reached.

AEC has told Pew and Ohio Oil that it is willing to negotiate a contract to buy some of the uranium.

•

The Bureau of Mines may revamp and reactivate its Albany, Ore., pilot plant for making zirconium.

The operation has been closed down since Carborundum started up its production plant. But the Atomic Energy Commission's needs have been running ahead of the plant's capacity, and AEC has asked how long it would take to get the 300,000-lbs./year facility back into operation. The bureau reports that it would take approximately three months. Some of the equipment is all set, but components of the plant have been sold, some have been dismantled. In addition, some of the skilled operating crew are no longer available.

•

Hooker Electrochemical is out with research quantities of four new chlorofluorocarbons based on its hexachlorobutadiene and hexachlorocyclopentadiene: 2,3-dichlorohexafluorobutene-2; 1,2-dichlorohexafluorocyclopentene-1; 2, 2, 3, 3-tetrachlorohexafluorobutane; and 2, 2, 3-trichloroheptafluorobutane. They're being groomed for a variety of jobs, principally in making resins and as refrigerants.

•

A new forming machine is quietly being put through its paces by its inventor, Aldan Simpson, at Bound Brook, N.J. It feeds on fibrous materials, produces a mat that can be impregnated with resins during the process. A larger model has been made for test purposes by Noble & Wood Machine Co. (Hoosick Falls, N.Y.), which is now building other units for commercial applications. Some of the firms that have placed orders are Trimount Plastics (Arlington, Mass.), Standard Tube (Detroit) and American Brake Shoe.

*Trade-mark of Borax Consolidated, Limited

Boron Tree

chemists—research scientists...

Here are your boron tools for research. Their diversification is great enough to spur imagination. Some of you have used Boron for petroleum additives... nuclear development... high temperature metals. You know its value to hundreds of other useful, though more prosaic, products such as washing powders, glassware and china. And we, as borate specialists, continue to put forth more growth on our "Boron Tree" in order that you may expand your research activities unhampered by lack of suitable boron chemicals.

Pacific Coast Borax Co.
Division of Borax Consolidated, Limited
Product Development Department CW
100 Park Avenue, New York 17, N.Y.

Please send technical data sheets

name_____

firm_____

address_____

city_____ state_____

(Please attach coupon to your business letterhead)

Pacific Coast Borax Co.
Division of Borax Consolidated, Limited
630 Shatto Place, Los Angeles 5 • 100 Park Ave., New York 17

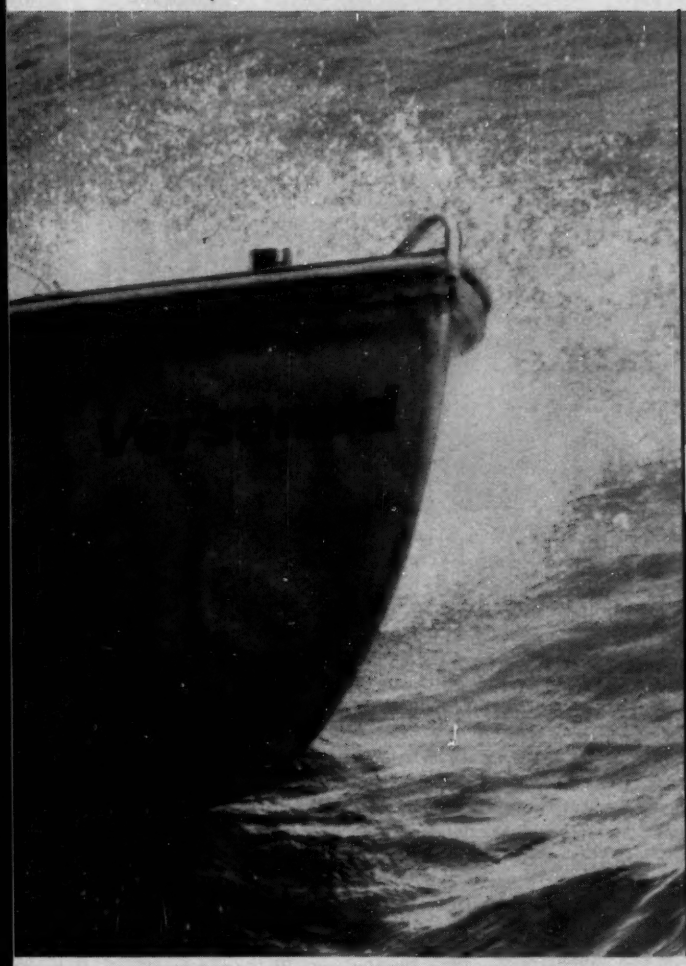
MANUFACTURERS OF FAMOUS "20 MULE TEAM" PACKAGE PRODUCTS

Test boat demonstrates of Versamid*-epoxy

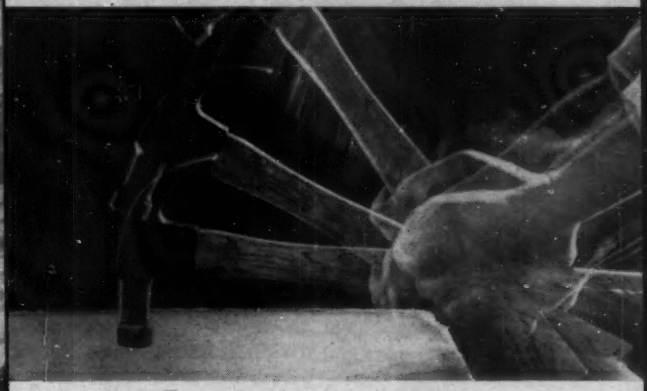
No fear of delamination here! Versamid-epoxy alloys adhere to glass fabric or mats, not just surround them. This gives laminates tremendous strength at high or low temperatures. A quick switch from broiling sun to freezing cold won't crack, distort or weaken them in any way. Versamid-epoxy alloys can be pigmented so they don't need paint, but the tough, glossy surface takes paint beautifully if necessary. Laminated products using this alloy show outstanding resistance to abrasion, mechanical impact, thermal shock, moisture, and solvents. Versamid-epoxy alloys can be applied with spray, knife or roller . . . bond to almost any surface with contact pressure only.

*Investigate **Versamids***
the versatile polyamide
resins made only by... **CHEMICAL DIVISION**

exciting properties alloy laminates!



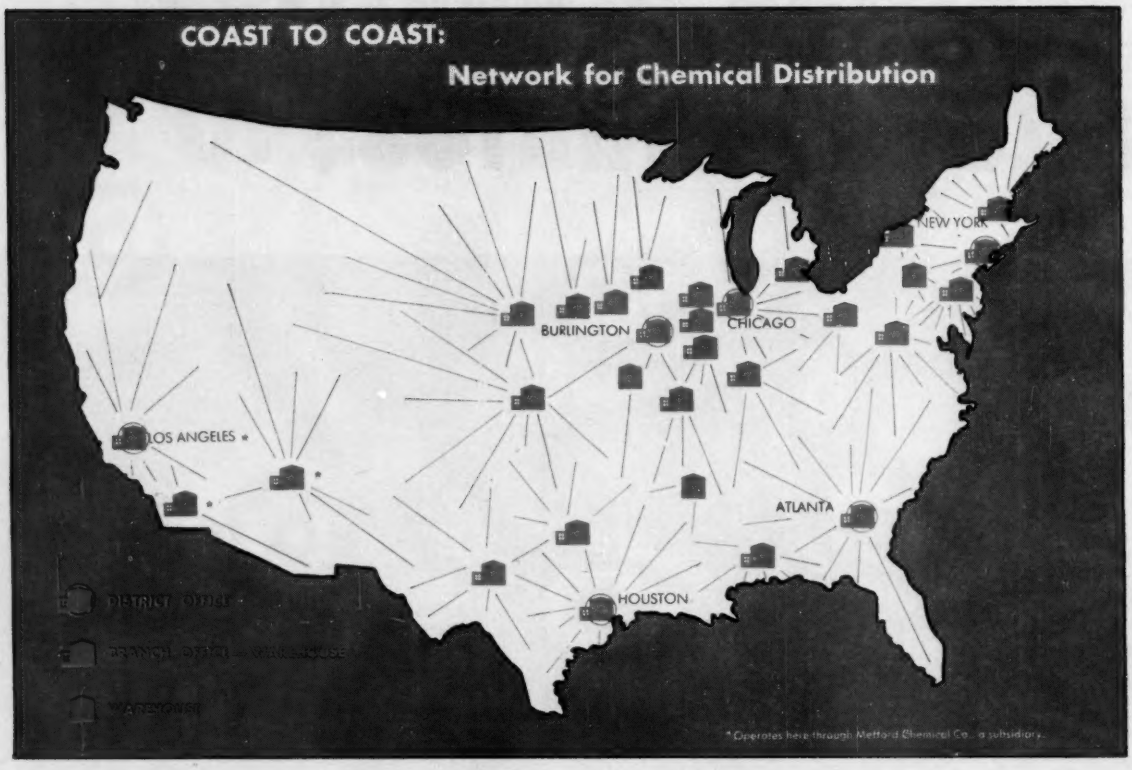
Safety note! Versamid-epoxy alloys emit no toxic or flammable fumes . . . have never been known to cause dermatitis.



Super tough! Tremendous impact resistance suggests many uses. Takes smashing blows like this without delamination.

How about your ideas? You probably can think of many uses for General Mills Versamids in other glass fiber laminates. Plastic pipe, modern furniture, aircraft components, automobile bodies, swimming pools, and printed circuit bases are among the "naturals." Versamid-epoxy alloys can be formulated to varying degrees of hardness. They cure with or without heat in a relatively short time. Versamid-epoxy alloys can be formulated to hold without "running" on vertical surfaces. Only Versamid polyamide resins make these alloys possible. To learn why, write for Technical Bulletin 11-E. If possible, state production needs so we can be of maximum service.

OF General Mills KANKAKEE, ILLINOIS



McKesson: Growth by Satisfaction

In just a few weeks, a sparkling, efficient new warehouse complete with "blow out" walls will be opened by McKesson & Robbins' Los Angeles subsidiary, Mefford Chemical Co. In its own right, the building could claim a bit of fame. But as a symbol of McKesson's Chemical Dept., the structure demands even more note. It's the latest example of the leaping growth that's characterized the firm's chemical distributing.

In the past three years, the department has doubled its sales, tripled its profits. This part of McK&R alone is believed to be the largest chemical distributor in the U.S. Its sales are estimated to be over $20 million annually. Within the past two years, the firm has:

- Acquired the Mefford operation;
- Added warehouses in Memphis, Tenn., Moberly, Mo., and Williamsport, Pa.;
- Added warehouses and branch offices at Quincy, Ill., Detroit, Pittsburgh, Atlanta, Milwaukee, Davenport and Sioux City, Ia.;
- Become a distributor of most of Carbide and Carbon's "distributor items."

Extending from coast to coast, the department operates 6 district offices, 31 branch offices, and maintains stock at 33 different cities. The inventory numbers about 450 standard articles of chemical commerce, is purchased from some of the largest chemical manufacturers in the U.S. Among well-known suppliers on McK&R's roster: Allied Chemical, Cyanamid, Carbide, Commercial Solvents, Dow, Monsanto, Du Pont, Hercules, Hooker, Blockson, Diamond Alkali.

Its credo of growth bulks large in McKesson's future plans. Right now, the company is evaluating the Pacific Northwest and the Harrisburg, Pa., areas for potential offices and stock points. Ultimately, the firm envisions a network of offices and stock terminals in every U.S. industrial area. And, by 1965, avers Senior Vice-President F. Dean Hildebrandt, the chemical department expects yearly sales of at least $50 million.

What's making McK&R the colossus of the chemical distribution world? *CW* put this question, in effect, to top officials of McK&R's chemical department. Here is the reply, revealing how the company's chemical operation functions:

Business Philosophy

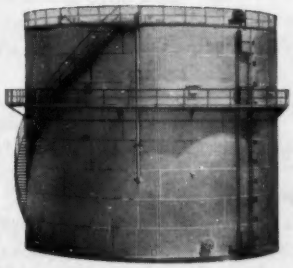
Backbone of all McKesson's sales efforts is a simple, yet effective, code of business principles. Its essence: maximum customer service through local stocks, local staffs, efficient delivery and scrupulously ethical trade practices. Believes McKesson: it's the man with the firm customer contacts, the ready availability of supplies, the economy of national-scale distribution, plus fair play, who brings the orders in.

today, there is a safer, simpler, surer way to store gas. The antiquated bell jar was the prototype of many gasholders still in use. The modern Wiggins gasholder, using a 100% dry seal, is the first successful departure from "bell jar" construction.

WIGGINS GASHOLDER

BY GENERAL AMERICAN

Only modern Wiggins Gasholders free you from weather worries and operating costs. More than 150 satisfied users now enjoy the advantages (no water, tar or grease) that this 100% dry-seal gasholder offers. The Wiggins Gasholder can be built to any capacity . . . with remarkable savings in construction cost. If there's a gas storage structure in your firm's future, write today for full information.



for chemical process and industrial gases

WIGGINS VAPOR SEALS GENERAL AMERICAN TRADE MARK

GENERAL AMERICAN TRANSPORTATION CORPORATION

135 South LaSalle Street
Chicago 90, Illinois

Offices in Principal Cities

Story begins on page 110

BERKSHIRE CHEMICALS INC
GRAYBAR BUILDING
420 LEXINGTON AVENUE • NEW YORK 17
LExington 2-5959 • "BERKSKEM" New York
55 New Montgomery St. • San Francisco 5, Cal.
Philadelphia • Boston • Cleveland • Chicago

Who makes the *Clearest Pyrethrum Extract?*

■ As the recognized pioneer in the development and processing of pyrethrum, MGK is the original and first producer of standardized pyrethrum extracts of brilliant clarity. In addition, we have developed excellent synergized pyrethrum concentrates, dusts and powders. If your insecticidal sprays, dusts or aerosols include the use of pyrethrum in any form, or the use of its companion product allethrin, write for the latest authoritative data. We also have available recent information concerning the most effective synergists, MGK 264 and piperonyl butoxide.

McLAUGHLIN GORMLEY KING Company
4712 S. E. FIFTH STREET / MINNEAPOLIS, MINNESOTA

HOW McKESSON DOES ITS PURCHASING

PROCUREMENT is centralized in New York, under the supervision of John Zacharias, also executive assistant to Hildebrandt. Contracts are made at the New York office; branches requisition against these commitments, often directly from the supplier. For transportation economy and to keep salesmen of the principals in contact with them, the branches have some leeway in specifying the supplier when several arrangements exist.

Byword of the operation: economy. Extensive use is made of dollar-saving mixed carload shipments, large orders, and "stop-overs" ("drop-offs" of parts of a given shipment at several locations).

Qualities that count high in Zacharias' estimate of a producer:

- Basic position for a particular commodity.
- Continuing flow of new products and a strong research program.
- Desire to work closely with, and "back up," the distributor.
- Products with many markets that suppliers can't profitably reach.

Selling Operations

Field activities of the chemical department pivot on branch offices and warehouses. Their location is skillfully correlated with the pattern of opportunity in an area. Inventories, too, are finely tuned to needs of local customers. For instance: feed supplements, an important line in the West, isn't carried at New York City.

Much of the firm's line is available at most of the warehouses. Of the 450 principal chemical materials in inventory, feed supplements, organic- and hydroperoxides, food processing chemicals, and metal-treatment supplies are some of the chief volume items. McK&R is the sole distributor of Diamond Alkali's Bell Division chloroform, Hercules' hydroperoxides to the plastic industry, Cadet Chemical's organic peroxides, Great Lakes Chemical's bromine, Hawaiian Pineapple's citric acid, and Zinc Oxide Co. of Canada's zinc oxide (in the U.S.).

Shipments vary in size from l.c.l. deliveries to carload and tank quantities. Some large orders are shipped directly from the producer. But even in such cases, billing is always from a McKesson office.

Repackaging does not now bulk large in the firm's business, although the Burlington, Ia., and the Mefford branch at Los Angeles do some repackaging. In the future, however, the company foresee's sharply stepped up drumming, other repackaging.

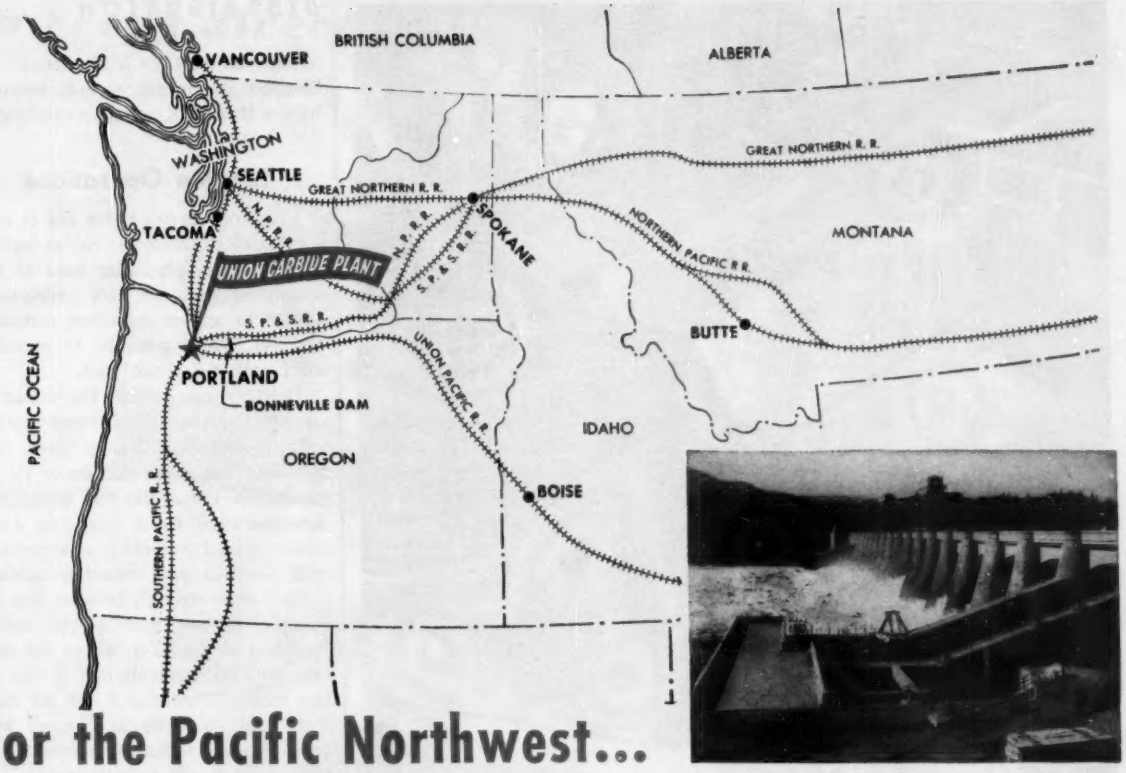
To promote its services, McK&R relies on business publication advertising, direct mail, and cooperative ventures with its principals. And, it is scheduling a sizable boost in its promotion budget. (Last year the chemical department added its own advertising manager.)

Organization

New York headquarters takes the responsibility for over-all planning, control, relations with suppliers, financing and purchasing. Generally, the district office shoulders responsibility for credit, bill payment, transportation policy, warehousing, personnel, and district-level sales direction. Assisting each district manager is an operations director and an accountant.

It's the task of the branch office to perform the actual servicing of accounts, warehousing, delivery and billing. Sales staffs vary in size from 2 to 18 (Mefford Chemical).

Unique in chemical distributor functioning is a rigorous cost accounting system. It's a big asset, asserts Hildebrandt, in keeping tabs on the profitability of a given phase of operations. Every branch has its own profit-and-loss statement. And the system enables chemicals to be classified. ("A" items ring up good profits; "B" commodities carry themselves in certain cases; and "C" products are handled for customer convenience and service alone.) Records are also maintained on the volume that salesmen handle in these categories.



For the Pacific Northwest... Volume Acetylene at Portland

Acetylene—an important raw material for chemical synthesis—can be supplied in large volumes at Portland, Oregon. If you are planning a new chemical plant in the Northwest, and will use acetylene as a raw material, consider the advantages of having acetylene delivered directly by pipe line. No generation equipment is needed at your plant.

Portland offers these advantages:

1. **Desirable Plant Sites.** Within piping distance of LINDE volume acetylene are many choice locations for your new plant in the Portland area.

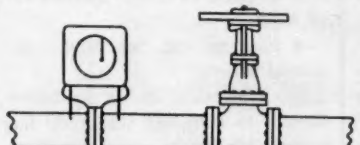
2. **Years of Experience.** Acetylene has been produced from UNION CARBIDE since 1898, and the many years of experience acquired in generating and handling acetylene are available to you at Portland.

3. **Favorable Transportation.** Plants located in Portland enjoy strategic transportation advantages. Five major railroads and a number of motor-truck lines serve the area. Portland also has the advantage of a deep-water harbor. Shipment of your products can be made by water between Portland and West Coast cities in the United States and Canada.

4. **Power at Low Rates.** Hydro-electric power can be purchased at economical rates. Bonneville Dam (pictured above) is nearby.

UNION CARBIDE is also produced at Ashtabula, Ohio; Niagara Falls, New York; and Sault Ste. Marie, Michigan. Bulk shipments to chemical users can be made from any of these plants, including Portland. Drum stocks for industrial users are maintained at 111 warehouses throughout the United States.

Whatever your plans or requirements, you are invited to telephone or write to LINDE'S CARBIDE-ACETYLENE DEPARTMENT for technical and sales information.



Acetylene • Sold by Meter

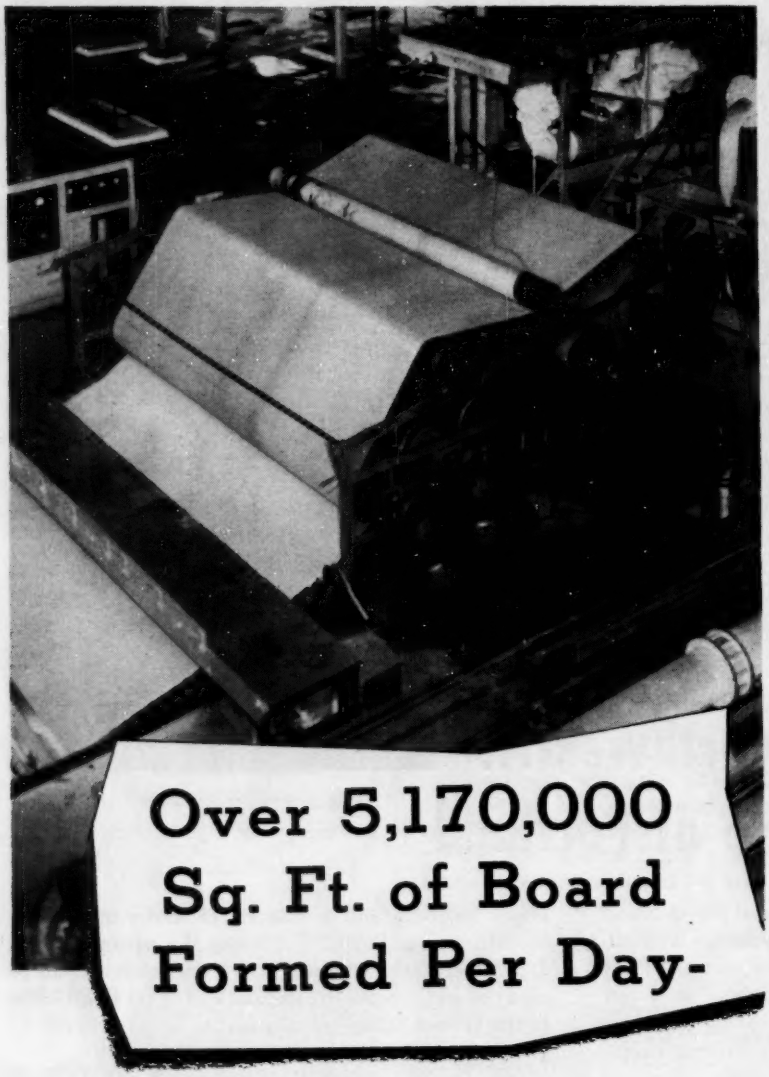
LINDE AIR PRODUCTS COMPANY

A Division of Union Carbide and Carbon Corporation

30 East 42nd Street UCC New York 17, N. Y.

Offices in Other Principal Cities

"Linde" and "Union" are registered trade-marks of Union Carbide and Carbon Corporation.



How's That For Production?

Oliver high production Board Forming Machines form millions of sq. ft. of insulating and hard board daily from many kinds of material such as furnace slag or rock wool, bagasse or extracted sugar cane, pine, hard woods, birch, wattle, eucalyptus, extracted licorice root, mixtures of cork and asbestos, etc. These machines produce stronger board per given weight . . . form sheets of uniform density, caliper and strength.

Oliver Board Forming Machines may be of passing interest only, to you. However, it does point out the wide scope of Dorr-Oliver equipment and services.

If you have problems involving any phase of the separation of finely divided solids in suspension . . . or ion-exchange . . . or fluidizing techniques — chances are that Dorr-Oliver and its world-wide organization can help you.

DORR-OLIVER
INCORPORATED
WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT
STAMFORD • CONNECTICUT • U.S.A.

DISTRIBUTION . . . .

Also unusual for a distributor: the detailed statements of job responsibilities that McKesson has established.

Service Operations

Customer service is the ace of most successful distributors. No exception, McK&R pays particular heed to that axiom. Inventories are adequately geared to answer customer demands, and yet, where possible, to permit a stock-turn 6-8 times/year.

Delivery, too, reflects the dictum of customer service. The company strives for rock-bottom shipping costs, savings that can be passed on to its accounts. In Texas, this has meant McKesson-owned truck fleets; in other areas, rented vehicles, arrangements with contract and common carriers.

McKesson strongly believes that the supplier is best qualified to render technical service. Yet, where the sales responsibility warrants it, the firm offers technical assistance. On the New York staff: a technical director who answers some technical questions, refers others to the proper supplier.

Technical aid plays a particularly vital role in company sales of bromine, organic- and hydroperoxides, zinc oxide, and feed supplements.

Formula for Growth

To its fundamental criteria of local men, local stocks that meet each area's needs, and service, McKesson adds a few rule-of-thumb necessities for expansion. To warrant a new branch and warehouse, an area should require at least two salesmen. Additionally, the dollar volume should "approach one million."

New products are another important element in McKesson's growth. Broadly, the company likes to see a potential dollar volume "in six figures" per year before starting a stockpile. New acquisitions to the line should also be:

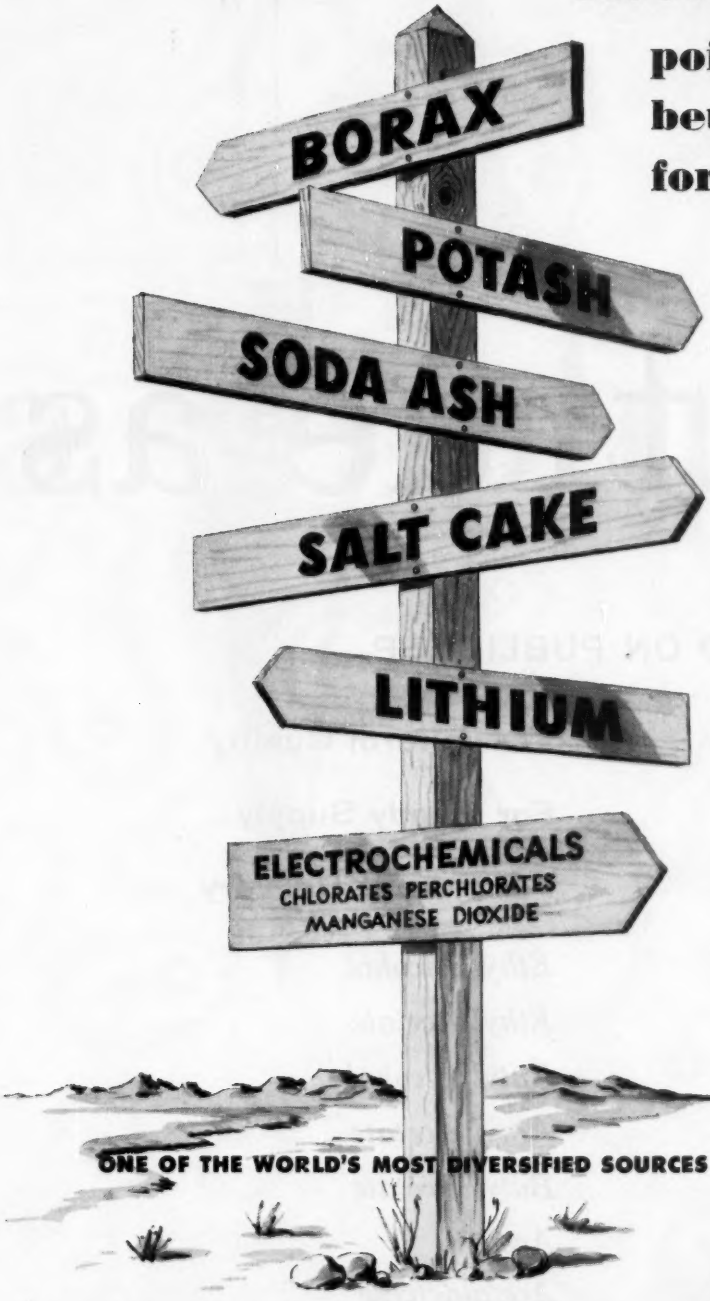
- "Good standard articles of commerce" . . .
- Capable of sale to a broad variety of users . . .
- Easy to sell, not need a lot of special effort.

As McKesson charts its future, it intends to fully use the credo largely responsible for its success in the past. Says Hildebrandt, "We'll grow by satisfying the needs of each area."

in every direction...

TRONA® CHEMICALS

point the way to better products for modern living



...through

BROAD DIVERSIFICATION

Best proof of Trona's versatility is the depth of Trona's services and ever-increasing demand for Trona products.

EXPANSIVE TECHNOLOGY

Greater productivity at Searles Lake, new lithium plant at San Antonio, and acquisition of Western Electrochemicals—all these attest to Trona progress and growth.

RESEARCH AND DEVELOPMENT

Trona is a pioneer and leader in a long-range research and development program for lithium and boron chemicals in its Whittier (Calif.) Research Laboratory.

ONE OF THE WORLD'S MOST DIVERSIFIED SOURCES OF BASIC CHEMICALS VITAL TO INDUSTRY AND AGRICULTURE

TRONA

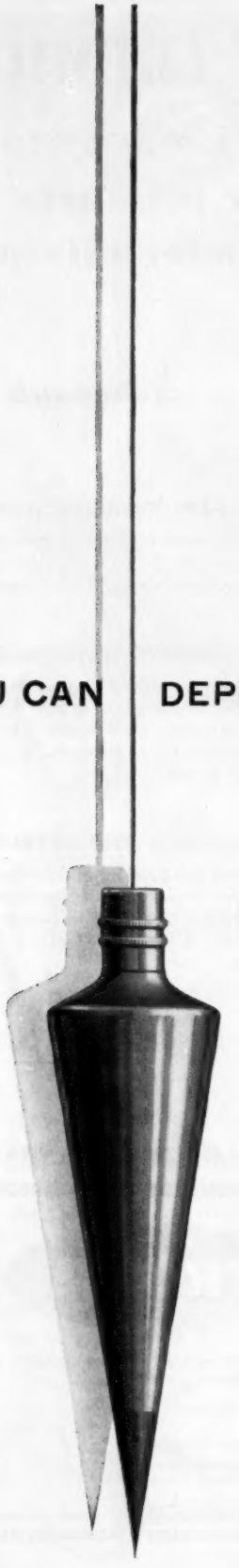
American Potash & Chemical Corporation

Offices • 3030 West Sixth Street, Los Angeles 54, California
99 Park Avenue, New York 16, New York
214 Walton Building, Atlanta 3, Georgia

Plants • Trona and Los Angeles, California; Henderson, Nevada
San Antonio, Texas (American Lithium Chemicals, Inc.)

Export Division • 99 Park Avenue, New York 16, New York

Producers of: BORAX • POTASH • SODA ASH • SALT CAKE • LITHIUM • BROMINE • CHLORATES • PERCHLORATES • MANGANESE DIOXIDE and a diversified line of specialized agricultural and refrigerant chemicals.



true as

YOU CAN DEPEND ON PUBLICKER

For uniform Quality

For steady Supply

For prompt Delivery

Ethyl Alcohol
Ethyl Acetate
Butyl Alcohol
Amyl Acetate
Butyl Acetate
Acetone
Acetaldehyde
Acetic Acid
Butadiene
Refined Fusel Oil

a plumb...

PUBLICKER INDUSTRIES Inc.

1429 WALNUT STREET, PHILADELPHIA 2, PA.

NEW YORK • NEW ENGLAND • MIDWESTERN DISTRIBUTORS, PUBLICKER ALCOHOL & CHEMICAL SALES CORP.

PHILADELPHIA — LOCUST 4-1400 • NEW YORK — OXFORD 5-4160 • BOSTON — HOMESTEAD 9-0022
CHICAGO — RANDOLPH 6-6678 • CLEVELAND — CHERRY 1-6140

DRAWINGS BY GORDON DRAPER

FORMULA: Snare the graduate . . . train him . . . give him to a customer.

Enlightened Give-Away

How far can you go with service? At Ferro, they turn company-trained men over to customers for keeps.

Three good reasons why: it enhances customer goodwill, helps Ferro sell, and boosts customers' know-how.

One hitch Ferro faces: getting recruits.

WITH engineers in such short supply, it's almost incredible that any company would recruit engineers, train them for a few years and then cheerfully send them to another company.

But that is precisely what Ferro Corp. (Cleveland frit manufacturer) is going to do again this year—a year that will produce about 100 ceramic engineer graduates. Waiting for them: 500 jobs in industry.

Each year, Ferro purposely places an average of four of its engineers, each with 1-2 years of Ferro training, with its customers. This policy (the brainchild of Ferro Vice-President Bob Weaver), over the years, has paid precious dividends. It's been the backbone of Ferro's sales and service to customers and a prime factor in the company's rise to market prominence.

Augmenting the give-away program: in-plant training of customer personnel at Ferro. So in demand has this phase been, that it led Ferro to erect a circus tent on its plant grounds to handle crowds.

Ferro's share-the-engineering-wealth plan has grown tremendously since its inception 20 years ago. At present almost 50% of the people in the porcelain enameling industry are Ferro "grads." These grads range all the way from research and production workers to top-level executives.

The men placed with customers by Ferro, almost without exception, come from Ferro's Product Development Laboratory, which has a standing personnel of about 25.

Engineers are ready for specialized activities in either the Ferro plant or with the customer after a year or two at Ferro. In the latter case, engineers can almost hand-pick their company. This embarrassment of riches doesn't result, however, in a funneling of personnel into one or two big companies, as might be expected. Before the men make their choice, Ferro's management makes a paternalistic effort to steer men to the positions in which they'll be most happy and have their talents used to best advantage. An effort is also made to direct men to those in the industry who most need their help.

Even after the choice is made and a Ferro-trained man goes with a customer, this may not end the relationship.

Occasionally, some engineers find themselves unhappy in their new surrounding, despite the soul-searching and consoling that preceded their transfer to their new employers. In such a situation, the discontented engineer can almost always terminate his position, expect to be welcomed back like the prodigal son in the Ferro fold. This turn of events is rare, however; most engineers have contentedly stayed in their new jobs.

Key to Sales: Ferro's self-depleting policy has never really been formalized, never had an official start. Still, it's a basic element in its success as a manufacturing and service industry. "The people we sell frit to," says Glen H. McIntyre, technical director and vice-president, "are basically production minded. They rely on us for technical advances and expect us to show

PLANT:
PRODUCTION:
PROCESS:
PRODUCT:

New from the ground up!
Allied-Chemical integrated!
Efficient and continuous!
Sets an industry standard!

FEW PRODUCTS ARE MARKETED WITH ALL THE ADVANTAGES OF National Aniline

ADIPIC ACID

$HOOC(CH_2)_4COOH$

Only once in a lifetime does this happy combination of plant, process and product advantages occur. National Aniline's new production of Adipic Acid at Hopewell, Virginia is exceptional in every respect. It represents a wholly-new, major integrated source of a much-needed, versatile dicarboxylic acid for the rubber, plastics, plasticizer, synthetic lubricant and chemical industries.

Hopewell is now producing important tonnage of ADIPIC ACID. Its output can be expanded as fast as the need arises. We welcome inquiries from present and prospective makers of adipates, adipic polyesters and polyurethanes for samples, technical data, price and delivery quotations.

SEND FOR TECHNICAL BULLETIN I-12

This comprehensive 8-page technical bulletin on National Adipic Acid gives physical and chemical properties; principal reactions to the carboxyl and alpha methylene groups; solubility curve, and suggested uses with copious literature references. Your copy will be sent without obligation on request.

NATIONAL ANILINE DIVISION

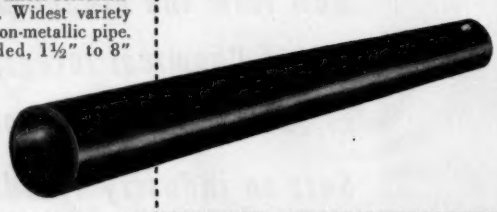
ALLIED CHEMICAL & DYE CORPORATION
40 RECTOR STREET, NEW YORK 6, N. Y.

Boston Providence Philadelphia Chicago San Francisco
Portland, Ore. Greensboro Charlotte Richmond Atlanta
Los Angeles Columbus, Ga. New Orleans Chattanooga Toronto

Allied Chemical

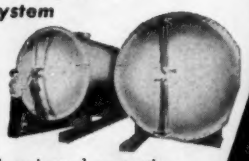
OLDEST PLASTIC PIPE STILL "TOPS"

ACE hard rubber . . . now more than a century old . . . long the finest corrosion-resistant pipe available. Widest variety of fittings of any rigid non-metallic pipe. Sizes ¼" to 8" threaded, 1½" to 8" flanged. *Bulletin CE-51.*



LIFE-TIME ACID STORAGE TANKS

Rubber-lined by ACE 2-layer system

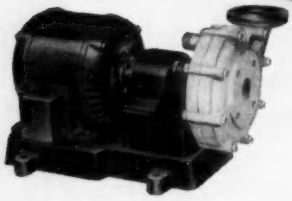


Economical, universal protection against all alkalis, metallic salts, practically all inorganic acids, hydrochloric acid any strength, sulphuric to 50%, nitric to 20%, phosphoric to 75%. Good to 160 deg. F. . . . sometimes higher. Soft rubber interlayer aids shock resistance.

ACE chemical equipment

"more resistant to more corrosives"

Complete line of rubber and plastic processing equipment . . . eight basic materials for pipe and fittings, valves, pumps, tanks, molded parts, utensils, etc.



ACE "WAM" . . . THE FINEST

Non-metallic Acid Pump

On job after job, this 80-gpm. centrifugal pump has earned highest praise. Hard rubber casing and impeller, Hastelloy C shaft. Handles nearly all corrosives. Mechanically simple, trouble-free. *Bulletin CE-55.* Larger ACE pumps available.

NEED SPECIAL FITTINGS, COVERS, TANKS, PARTS?

If you want life-time corrosion protection for special parts needed in quantity . . . we may save for you by molding them of ACE hard rubber or plastics to your most exacting requirements. Our facilities among world's largest. Ask for recommendations.

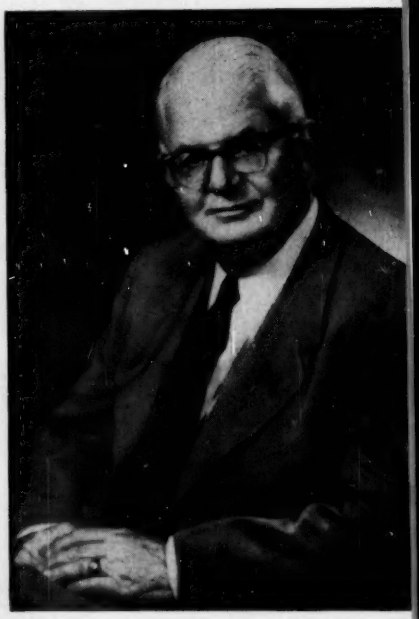
ACE rubber and plastic products

AMERICAN HARD RUBBER COMPANY

93 WORTH STREET • NEW YORK 13, N. Y.

DISTRIBUTION . . . .

Story begins page 118



WEAVER: Creator of Ferro's 'Marshall Plan,' the engineer give-away.

them how our products are supposed to work. The better technical control they have, the better our products will work." Included in this group of customers are large appliance makers, such as Maytag and Norge, which haven't the time or facilities to train ceramic engineers, depend almost 100% on Ferro and other frit makers for their production line needs.

Ferro, as well as the customer, reaps benefits of its give-away program. The bread-upon-the-water technical assistance they provide almost inevitably comes floating back in the form of sales orders from Ferro-trained men who reach junior and top-level positions with Ferro customer companies.

Enticement: When it recruits people for its development lab, Ferro has some attractive inducements. Their engineers are offered an opportunity to stay with the lab, aim for positions in the company's 11 foreign plants, find a spot in the company's own sales or production departments, or find employment with one of the customer companies. Most of the men look to sales, because they feel that's where the money is. Some, however, are converted into full-time researchers. The production-minded man usually ends up in the customer's plant.

Spencer Service is Wonderful

"There goes that Tanky! Hasn't taken a vacation in years!"

NEED AMMONIA?

As one of the nation's leading producers of industrial ammonia Spencer Chemical Company can supply you with top quality Aqua Ammonia, Refrigeration Grade Ammonia and Commercial Grade Ammonia. And a wire or phone call to Spencer means you get that fast "Tanky" delivery service so many customers have praised.

SPENCER®

America's Growing Name In Chemicals

SPENCER PRODUCTS: "Poly-Eth" Polyethylene • Ammonia (Commercial and Refrigeration Grade) • Aqua Ammonia • 83% Ammonium Nitrate Solution • Synthetic Methanol • Formaldehyde • Hexamine • "Mr. N" Ammonium Nitrate Fertilizer • SPENSOL (Spencer Nitrogen Solutions) • FREZALL (Spencer Dry Ice) • Cylinder Ammonia

SPENCER CHEMICAL COMPANY

GENERAL OFFICES: Dwight Bldg., Kansas City 5, Mo. DISTRICT SALES OFFICES: 500 Fifth Avenue, New York City; First National Bank Bldg., Chicago, Ill.; Candler Bldg., Atlanta, Ga.; Union Planters National Bank Bldg., Memphis, Tenn.

Dicalite Filteraids can give *Increased* clarity!

This is really an odd one. It started with a bottle of distilled water in a Dicalite laboratory, tight-stoppered in a sterile container. For certain reasons we had cause to question it. So we filtered it, using the finest grade of Dicalite filteraid—and removed microscopic solids which had survived distillation!

While this was a laboratory matter, it is of real importance to every man concerned with the clarification of process liquors, or with the separation of finely divided solids from liquids. If you require filtration so "sharp" that it will trap better than 95% of bacteria and other submicron-sized solids, there are Dicalite filteraids that do just that. Other Dicalite filteraids give faster flow-rates, yet still yield filtrates of sparkling clarity. No matter what your standard of clarity, there is a Dicalite filteraid which will meet it, or surpass it. We will be glad to advise with you on your particular process problems. Write us!

25 YEARS Dicalite

Dependable GLC GREAT LAKES Dicalite® DIATOMACEOUS MATERIALS

DICALITE DIVISION • GREAT LAKES CARBON CORPORATION,
612 SOUTH FLOWER STREET, LOS ANGELES 17, CALIFORNIA

DISTRIBUTION . . . .

At present, things are not too conducive to an open-handed giving away of technical personnel. Since the Korean War, Ferro, along with everyone else in the industry, has found itself sadly depleted by military demands for personnel.

Replacing them has been difficult, and Ferro's eventual goal—a larger pool of engineers destined for customer use—will not be achieved this year, or next.

To woo people to its side, Ferro must compete with other frit makers, potteries, glass companies, aircraft companies and such large-scale government project experimenters as General Electric. Recruiting is a full-time, long-term job.

One of the best aids in securing engineering talent has been the contest Ferro conducts each year among engineering students. This competition consists of a 3,000-word essay to be written on any phase of porcelain enameling. The entry list for this contest, and especially the winners circle, provides Ferro with its prime target for recruitment—and it looks at every likely candidate.

Problems: Even with all the inducements Ferro can offer potential employees—foreign plants, wide choice of final activity—they still won't get all the men they want. Ferro would like to hire 25 men of this year's graduating class—they'll probably get three.

Just how rough a problem Ferro faces is apparent by looking at the situation in Ohio, where Ferro would be most expected to get help. The state university there will turn out two ceramic engineers this year. One of them is headed for the Navy, the other to work in his father's plant. And that's a fairly typical situation.

In desperation, Ferro has even gone the nontechnical direction, has on occasion recruited liberal arts majors who demonstrated proficiency in science. Not too much is expected from this source but Ferro's not passing up any bet.

The situation, tough as it is, hasn't discouraged Ferro. As soon as things ease up, it plans to step up its customer technical aid program, intensify the sending of friends into customer plants. It's obviously an attempt at "infiltration"—but it's one that will result in better conditions for both customer and supplier.

EMERGENCY call to Merchants' Chicago office from steel products manufacturer. Broken acid tank has closed down plant. Need six carboys of Formic Acid immediately.

SPECIAL small delivery truck — held by Merchants for emergency shipments — is loaded. Merchants' assistant warehouseman has union driver's license for just such a situation.

MERCHANTS' SERVICE RE-OPENS PLANT IN 45 MINUTES!

Special service on industrial chemicals is routine at Merchants Chemical. Thirty-five years experience has given Merchants a close understanding of customer problems . . . the kind of understanding that provides ahead of time for emergencies. The instance cited above illustrates the foresighted coordination that is typical of the service available from any one of Merchants' nationwide chain of offices and stock points. Products offered include acids, alkalis, fungicides, surfactants, chlorinated solvents, emulsifiers, laundry compounds, soaps, dry ice and chemical specialties.

WAVED ON at gate by plant guard, Merchants truck speeds past waiting vehicles right through to unloading area.

DELIVERY COMPLETED to waiting lift truck. Total time from initial call — less than 45 minutes!

SERVICE QUALITY MERCO

MERCHANTS CHEMICAL COMPANY, INC.

60 East 42nd Street, New York 17, N. Y.

SALES OFFICES AND WAREHOUSES: CHICAGO • CINCINNATI • DENVER • LOUISVILLE • MILWAUKEE • MINNEAPOLIS • NEW YORK • OMAHA
STOCK POINTS: ALBUQUERQUE, N. M. • ERWIN, TENN. • S. NORWALK, CONN.

acetic acid

methanol

Highest quality, glacial or standard strength acetic acid. 56-80-84 per cent solutions. • Denaturing grade methanol. Good color and odor • Available in tank cars or drums.

CROSSETT CHEMICAL COMPANY
P. O. Box 271 . FOrest 4-2142
crossett, arkansas

Danitra

NITRATES

POTASSIUM
BARIUM
SODIUM
STRONTIUM

Davies Nitrate Co.
INCORPORATED
115 LIBERTY STREET NEW YORK 6, N. Y.

DATA DIGEST

• **Potassium cyanide solutions:** 4-p. folder spotlights handling, purity and safety of Koppers' cyanide liquids. Koppers Co. (Pittsburgh, Pa.).

• **Wood pallet repair:** 34-p. manual gives information for modifying standard pallets to other sizes and for maintaining them in good condition. No. PB111755, Office of Technical Service, U.S. Dept. of Commerce (Washington).

• **Reinforced plastic:** folder gives properties of Garan, Vitron and Chrome roving for rod stock, molding compounds, preforming and other uses. TLP 1, L.O.F. Glass Fibers Co. (Toledo, O.).

• **Plastic pipe:** comprehensive, 64-p. study of various types of plastic pipe including mechanical, physical and cost characteristics. Market figures, pipe production and distribution costs, and the future of plastic pipes are also considered. Monsanto Chemical Co. (Springfield, Mass).

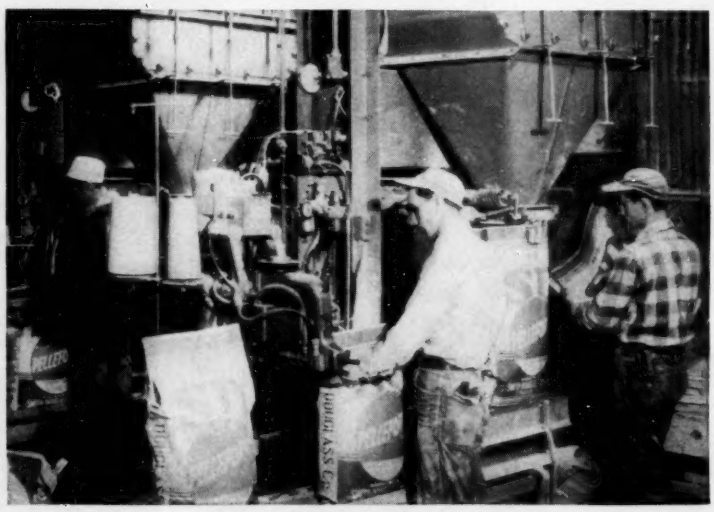
• **Western potential:** brochure describes the current level of industrial chemical activity and the future potential of the Far West (San Francisco Chamber of Commerce).

• **Lithium hydroxide:** brochure contains specially selected information for petroleum, storage battery and lithium salt industries. American Potash & Chemical Corp. (Los Angeles).

• **Acrylate elastomer:** 25-p. booklet furnishes formulations, curative system, and test data on solvent-resistant Vyram elastomer. Monsanto Chemical Co. (St. Louis).

•

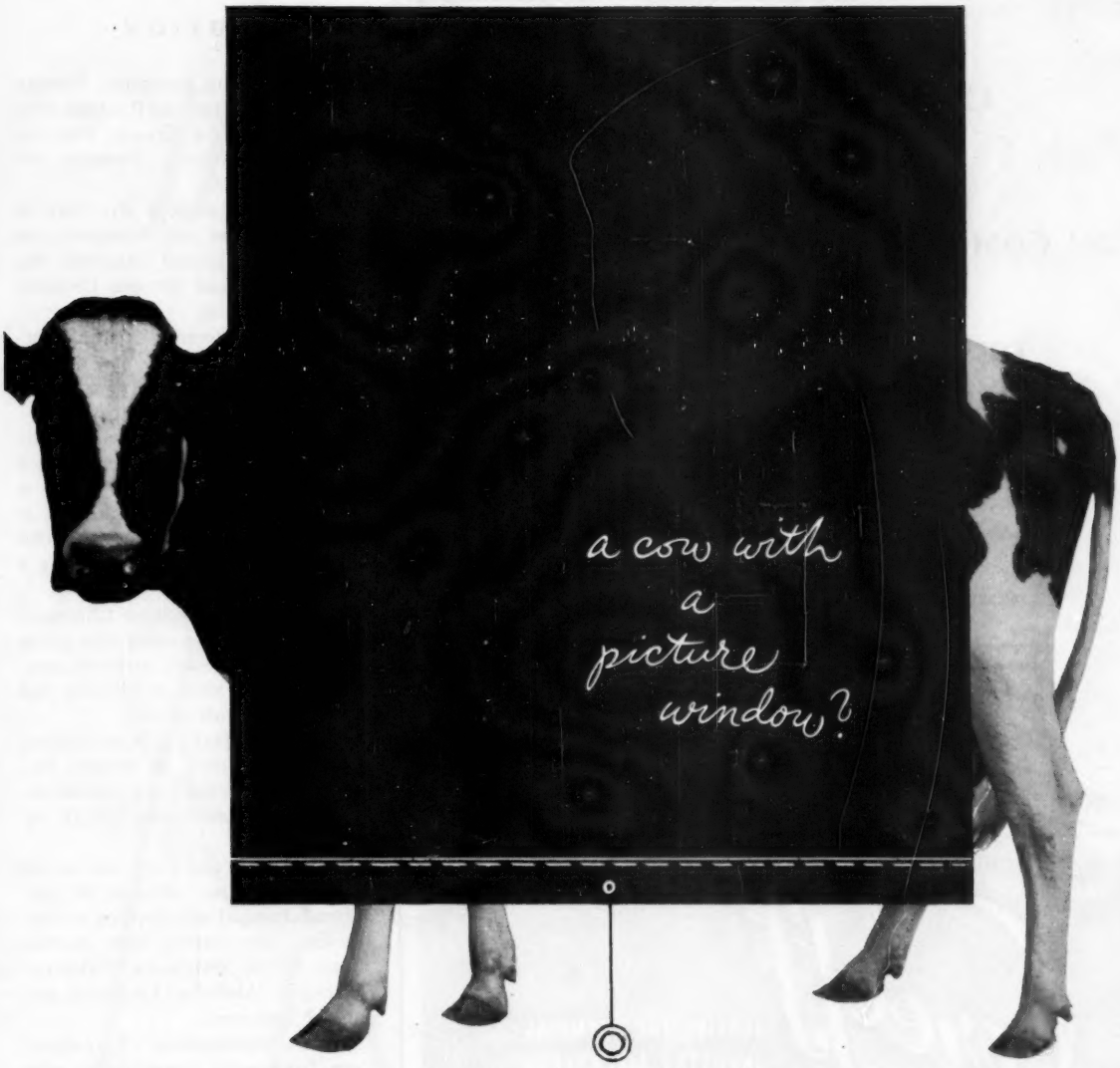
Expanding Sales Coverage: American Potash & Chemical Corp. will soon have Western district sales offices in San Francisco and Portland. The San Francisco branch will serve cen-



Precision Pack for Profit

SIZABLE OVERAGE needn't be a profit-devouring gift in your loaded bags. Modern machinery is becoming increasingly capable of filling to close tolerances. To illustrate: Bemis Bros. Bag Co. (St. Louis) is introducing a new fertilizer packer that's claimed to fill 50- to 100-lb. bags to an accuracy of 4 oz. at a rate of 16-18 80-lb. sacks per minute. Both sewn open-mouth paper bags and textile sacks can be processed.

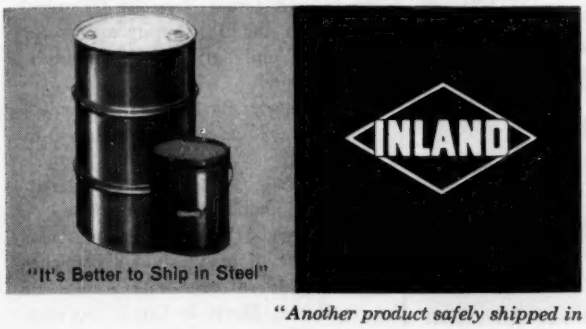
The new filler also permits insecticide treatment of the fertilizers at the time of bagging instead of during the fertilizer-mixing stage—by means of an optional accessory, the Jetrol Injector. Claimed advantage: reduced toxicity hazard.



The scientific teams at the Agricultural Research Center of Chas. Pfizer & Co., Inc., will go to practically any length in their search for new "miracle" products to make animals grow faster and stay healthy. They actually installed a "window" in a cow's stomach to study nutritional processes in their search for more effective growth stimulating feed supplements. This is just one example of the never-ending research that has made Pfizer a leading manufacturer of antibiotics.

Maintaining the purity of their products is so vitally important that Pfizer takes the scientific approach in selecting their packaging, too. In searching for a container to ship antibiotic intermediates from their huge Vigo, Indiana, plant to their eastern factories, Pfizer considered and tested many types of containers. Inland *lined* steel containers were finally selected on the basis of (1) their ability to protect costly intermediates perfectly under all shipping conditions, (2) their economy, (3) their rugged strength. "We've depended on Inland drums for several years," says C. W. Smith, Vigo plant superintendent. "And they've never let us down."

NOW . . . ABOUT *YOU*. Maybe your product doesn't demand the extreme care that must be used in packaging wonder drugs. But whatever you make, and no matter how carefully you make it, the follow-through of skillful packaging is too important to be overlooked. For complete information on new developments in steel packaging that may solve your problems, write Bob Boecher, Dept. 313A today.



Full line of steel and stainless steel shipping containers, including galvanized and heavy duty ICC drums.

INLAND STEEL CONTAINER COMPANY

Division of Inland Steel Company • 6532 South Menard Avenue Chicago 32, Ill. • Plants: Chicago, Jersey City, New Orleans, Cleveland, Greenville, Ohio.

"Another product safely shipped in Inland 'protection-eered' Containers"

CHEMICAL FINANCING

Specialized assistance in

COMPANY DIVERSIFICATION

and

DEVELOPMENT PLANNING

within the process industries.

•

CHEMICAL DEPARTMENT

RICHARD B. SCHNEIDER
Vice President

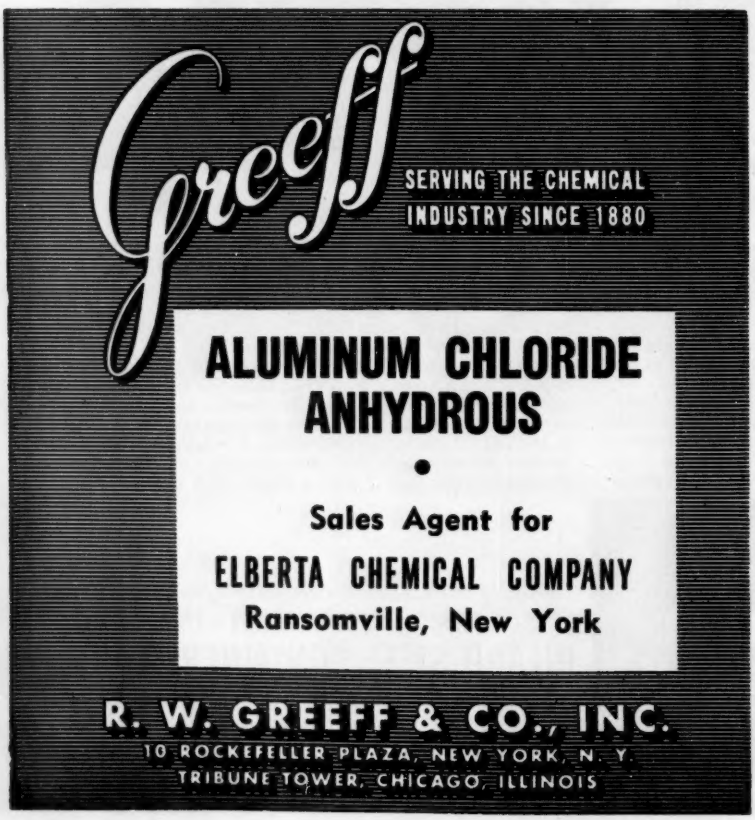
DON C. WHEATON
Assistant Vice President

•

Empire Trust Company

7 West 51st Street New York 19, New York

Member Federal Deposit Insurance Corporation



DISTRIBUTION . . . .

tral and northern California, Nevada, Utah and Colorado; the Portland office will handle sales in Oregon, Washington, Idaho, Montana, Wyoming and British Columbia.

• Allied Chemical & Dye Corp. is consolidating the San Francisco sales offices of its General Chemical, National Aniline, and Nitrogen Divisions into one location.

• Stauffer Chemical Co. has initiated construction of a new 15,000-sq.-ft. warehouse (in Vernon, Calif.) for its Molded Products Division.

• Cominco Products, Inc., recently set up to sell fertilizer of Consolidated Mining and Smelting Co. Ltd., is building a $1-million storage plant at Trentwood, Wash. Capacity: 50,000 tons of bagged fertilizer, excluding a planned tank farm.

• Du Pont's Petroleum Chemicals Division is setting up a new sales group for additives. Reason: to foster commercial development of additives and improved customer service.

• Rohm & Haas Co. is establishing warehouse facilities in Bristol, Pa., for plastics, resins and chemicals. Floor space approximates 150,000 sq. ft.

• Shell Chemical Corp. has moved the Jackson, Miss., office of its agricultural chemical sales division to New Orleans. Area served now encompasses Texas, Oklahoma, Arkansas, Mississippi, Alabama, Louisiana, and parts of Tennessee.

• Columbia-Southern Chemical Corp. has opened a new district sales office at Houston, Tex.

• Commercial Solvents Corp. is enlarging its marketing organization in the South by augmenting its sales staff.

• Du Pont's Kinetic Chemicals Division has added a new, separate Western district office at Menlo Park, Calif., to service customers west of the Rockies.

• Wilson Chemical Sales Co. (Portland) and Great Western Chemical Co., sales and distributing agents for industrial and agricultural chemicals, have merged.

• Pennsylvania Industrial Chemical Corp. is opening a new warehouse in Cincinnati.

• Darlington Chemicals (Philadelphia) has named B. E. Dougherty Co. (Los Angeles) Western representative for its line of magnesium oxide, carbonate and hydroxide salts.

• Parke, Davis & Co. is opening

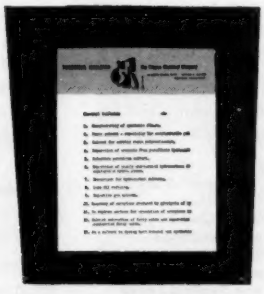
Dimethyl Sulfoxide

A most unusual NEW Solvent...

Dimethyl Sulfoxide is a clear water-white, very hygroscopic and completely water soluble liquid. It is believed to be non-toxic and has little odor and is only slightly bitter to the taste. It has a high boiling point, high flash point and low freezing point when mixed with water.

Among its many potential uses are:

- **Desulfurization and separation of petroleum fractions by selective solvent action.**
- **Solvent for acetylene and other gases.**
- **As a solvent for use in the spinning of synthetic fibers.**
- **Solvent for certain plastics.**
- **Paint removal.**
- **Insecticide (Fly) synergist.**



Write for Information

Additional information on Stepan Dimethyl Sulfoxide may be obtained by writing for DMSO TECHNICAL BULLETIN

STEPAN

CHEMICAL COMPANY
20 North Wacker Drive • Chicago 6, Illinois
Telephone: CEntral 6-5511

PATTY ALCOHOL SULFATES • BULK LIQUID DETERGENTS • SULFONATED OILS • AMIDES • FOAM STABILIZERS • ALKYLPHENOL POLYALKOXY SULFATES

LITHIUM METAL AND ALLOYS
LITHIUM HYDRIDE
LITHIUM HYDROXIDE
LITHIUM CARBONATE
LITHIUM CHLORIDE—BRINE—etc.

LITHIUM
MAYWOOD

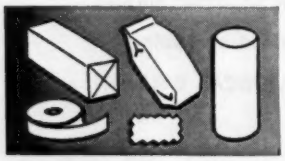
Pioneers in Lithium since 1901

MAYWOOD CHEMICAL WORKS
MAYWOOD, NEW JERSEY
ESTABLISHED 1895

Now... effective heat seal bonding at low temperatures with ARCCO Emulsions, Solutions or Hot Melts

For example, do you want to eliminate a costly drying cycle? If so, your answer is an ARCCO hot melt. Do you want a non-tacky coating that you or your customer can subsequently heat seal? Again, the answer is an ARCCO heat seal emulsion or solution. These versatile compounds can be heat sealed at temperatures from 220°F to 400°F, and may be used with conventional equipment.

ARCCO heat seal emulsions, solutions or hot melts open new possibilities in many fields for bonding paper, fabric, films, and foils used in the following end products:



Upholstery — automobile, furniture
Wearing Apparel — jackets, belts, accessories
Surgical Goods
Mending Tapes
Heat Seal Patches
Candy and Gum Wrappers
Potato Chip Bags
Food Packages
Rug Bindings
Textile Labels
Edge Sealing Tapes
Garment Labels
and possibly your product.

ARCCO Technical Service will be happy to consult with you about the application of these newest ARCCO emulsions and solutions to your product or its package.

THE BORDEN COMPANY
CHEMICAL DIVISION
AMERICAN RESINOUS DEPARTMENT
RESIN EMULSIONS, SOLUTIONS AND HOT MELTS, FOR ADHESIVE BASES, BINDERS, COATINGS, SIZES AND SATURANTS.
103 FOSTER ST., PEABODY, MASS.
In Chicago: Reslac Dept., 3634 W. 38 St., Chicago 32, Ill.
In Canada: American Resinous Chemicals of Canada Ltd., 20 Trent St., Toronto, Canada

DISTRIBUTION . . . .

sales offices in Karachi, Pakistan. Also, Parke, Davis & Co., Ltd., is adding a new Canadian branch. Located at Edmonton, Alta., the branch will handle sales in the four Western provinces of Canada.

• Foremost Food and Chemical Co.'s El Dorado Division has designated two new sales agents for its line of coconut oil fatty acids, methyl esters, Defoamer ED and other chemicals. For Michigan and northwestern Ohio, Harry Holland & Sons (Detroit); for southern Ohio and eastern Kentucky, Howard Dock (Cincinnati).

• Loven Chemical of California is setting up a new sales division, Plastic Material Manufacturers of California. The division will sell products other than the phenolic molding compounds that Loven produces. The new division has been selected as distributor by the Plastics Division of Sieberling Rubber Co. (Newcomerstown, O.) and Isocyanate Products, Inc. (Wilmington, Del.).

• Brazil Oiticica, Inc. (New York) has chosen Carl A. Lechner Co. (Chicago) as representative in Illinois, Indiana, Wisconsin and Iowa for raw liquid oiticica oil.

• Barrett Division, Allied Chemical & Dye Corp., has reorganized its marketing function to create better coordination between its thermoplastic and thermosetting plastics sales activities.

• Carbide and Carbon Chemicals Co. has opened a new warehouse at Birmingham, Ala.

• Toledo Porcelain Enamel Co. has picked Howard S. Jones and Co. (Chicago) as manufacturer's representative for V-Corr and architectural porcelain enamel products in central and northern Illinois and southern Wisconsin.

• American Cyanamid has selected Mead Board Sales, Inc. (Lynchburg, Va.) and Sonoco Products Co. (Hartsville, S.C.) as sales agents for Accopak paper pallets. In another move, Cyanamid has formed a new sales area (headquartered in Portland) to service all states west of the Rockies.

• Lion Oil Co. is establishing a new chemical sales office at Des Moines, Iowa.

•

Pep for Tile: To bolster sales, members of the plastic wall tile division of the Society of the Plastics Industry are launching a full-scale

Corrosioneering News

Quick facts about the services and equipment Pfaudler offers to help you reduce corrosion and processing cost.

Published by The Pfaudler Co., Rochester, N.Y.

Temperature: up to 550° F.
Contamination: 0

Contamination from walls of kettle was eliminated by using this 3500-gal. glassed steel vessel.

How this reactor solves 6 problems for Argus Chemical

Making heat and light stabilizers for PVC is a touchy job. You can't risk contamination of your product, and you have to control temperatures within ±1° F., if you want to produce the best quality.

And your operating temperatures range up to 550° F. This combination of conditions posed quite a problem for the men assigned to select equipment at Argus Chemical. They needed a material that was: 1) easy to clean, 2) nonadherent, 3) nonmetallic, 4) capable of accurate heat transfer, 5) corrosion resisting and 6) immune to high temperatures.

Argus solved their problem with the 3500-gallon Pfaudler glassed steel reactor shown here. Using the acid-alkali resisting properties of Pfaudler glass, backed by the structural strength of steel, they added a forced recirculation heating system using Aroclor 1248, Monsanto's fire-resistant heat transfer oil. This gave the fine temperature control they insisted upon. Because practically nothing sticks to glass, they had their freedom from contamination.

You can now obtain these Pfaudler glassed steel reactors in low-cost standard designs, up to 4,000 gallons. Besides the advantages mentioned above, they incorporate many convenience features, such as extra-big manhole, a total of nine top head openings, exclusive Pfaudler agitation, offset bottom outlet and others.

NEW TAKE-IT-APART AGITATOR IS EASIER TO USE AT BOTH ENDS

Increases reactor utility, decreases maintenance cost

Now glassed steel is easier than ever to use! Besides its exceptional corrosion resistance and reasonable cost, it is fast becoming the most flexible equipment on the market.

Latest development is a separable blade agitator, which you assemble *inside* the reaction kettle.

This permits you to switch impellers in a jiffy, without disturbing the drive or seal. And it enables us to use a smaller agitator opening, providing more working space at the top head for additional openings, if desired.

Needs only 2 tools

All you need to assemble the impeller are a socket wrench and a strap wrench. Assemble the two sections of the blades, anchoring them with the bolt provided. Then cap the assembly with glassed hex nut. Glass and Teflon are the only materials exposed to your product.

Besides lowering maintenance and changeover time, this agitator cuts stock costs, because you don't have to store the whole fixed agitator-impeller assembly. Just stock an extra impeller, at much lower cost.

Stuffing box or seal

At the top end, another new development increases the versatility of this agitator. It's designed to work with either stuffing box or rotary seal, permitting changeover in a matter of minutes. This is important when your process changes and a different type of seal is needed quickly.

At present, these agitators are being placed into production, and will be available at a later date, soon to be announced.

IMPELLER has separable blades held together by glassed hex nut.

TOP END fits either rotary seal or stuffing box.

BOTTOM END has separable blade impeller, assembles quickly and easily.*

*Patents pending

Getting it there is half the headache

Transfer of corrosive products can give you nightmares.

Piping, valves, fittings must be corrosion resistant—and rugged as well.

In our new Bulletin No. 886, you'll find a complete description of Pfaudler heavy duty glass lined pipe, valves and fittings to ease your worries. Write for your copy.

Reprints available:

Study reveals influence of carbon in glassed steel

The role of carbon in the enamelling of steel is important to you, if you process corrosive chemicals, since glassed steel is often the only equipment suited for such service.

After a thorough probe into the subject, three authorities have pooled their knowledge and incorporated their findings in a paper which appeared in the Journal of the American Ceramic Society.

Its title: "Some Influences of Carbon in Enamelling of Steel." The authors: Gordon P. K. Chu (of Pfaudler research), J. K. Magor (R.P.I.) and H. M. Davis (Penn State). Reprints available on request.

SODIUM BICARBONATE, U.S.P.

Specialized Grain Sizes

•

MONOHYDRATE of SODA

•

SAL SODA

•

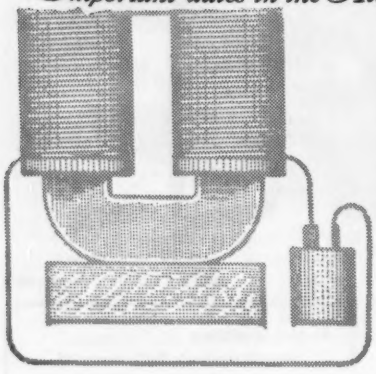
Technical Service

CHURCH & DWIGHT CO., Inc.

70 Pine Street **New York 5, N. Y.**

Phone Digby 4-2181

Important dates in the History of Industrial Progress



1828

In electricity . . .

American scientist Joseph Henry demonstrated the first electromagnet. He was the first to produce acoustic signals at a distance by this forerunner of Morse's telegraph.

In the history of fats and waxes

GROCO 4 DISTILLED RED OIL (OLEIC ACID)

Titre	4° – 6°C.
Cloud Point	42°F. max.
Color 1" Lovibond Red	2 max.
Color 1" Lovibond Yellow	15 max.
Unsaponifiable	1.5% max.
Saponification Value	198 – 203
Acid Value	197 – 202
% F.F.A. as Oleic Acid	99 min.
Iodine Value (WIJS)	95 max.
Refractive Index 50°C. (Average)	1.4500

Gusserow differentiated oleic and other unsaturated acids from palmitic and stearic acids on the basis of the differential solubilities of their lead salts.

Today, A. Gross & Company utilizes modern distillation equipment and exacting controls to produce oleic acid with a minimum of saturated fatty acids and with exceptional oxidation stability. GROCO 4-DISTILLED RED OIL, made entirely from animal fats, is one of five grades available to manufacturers.

Send for samples and catalog "Fatty Acids in Modern Industry".

A. GROSS & COMPANY

295 Madison Avenue, New York 17, N. Y.

Factory: Newark, N. J. Distributors In Principal Cities

Manufacturers Since 1837

DISTRIBUTION . . . .

merchandising and publicity campaign. It will tie in with the celebration this year of the industry's 10th anniversary.

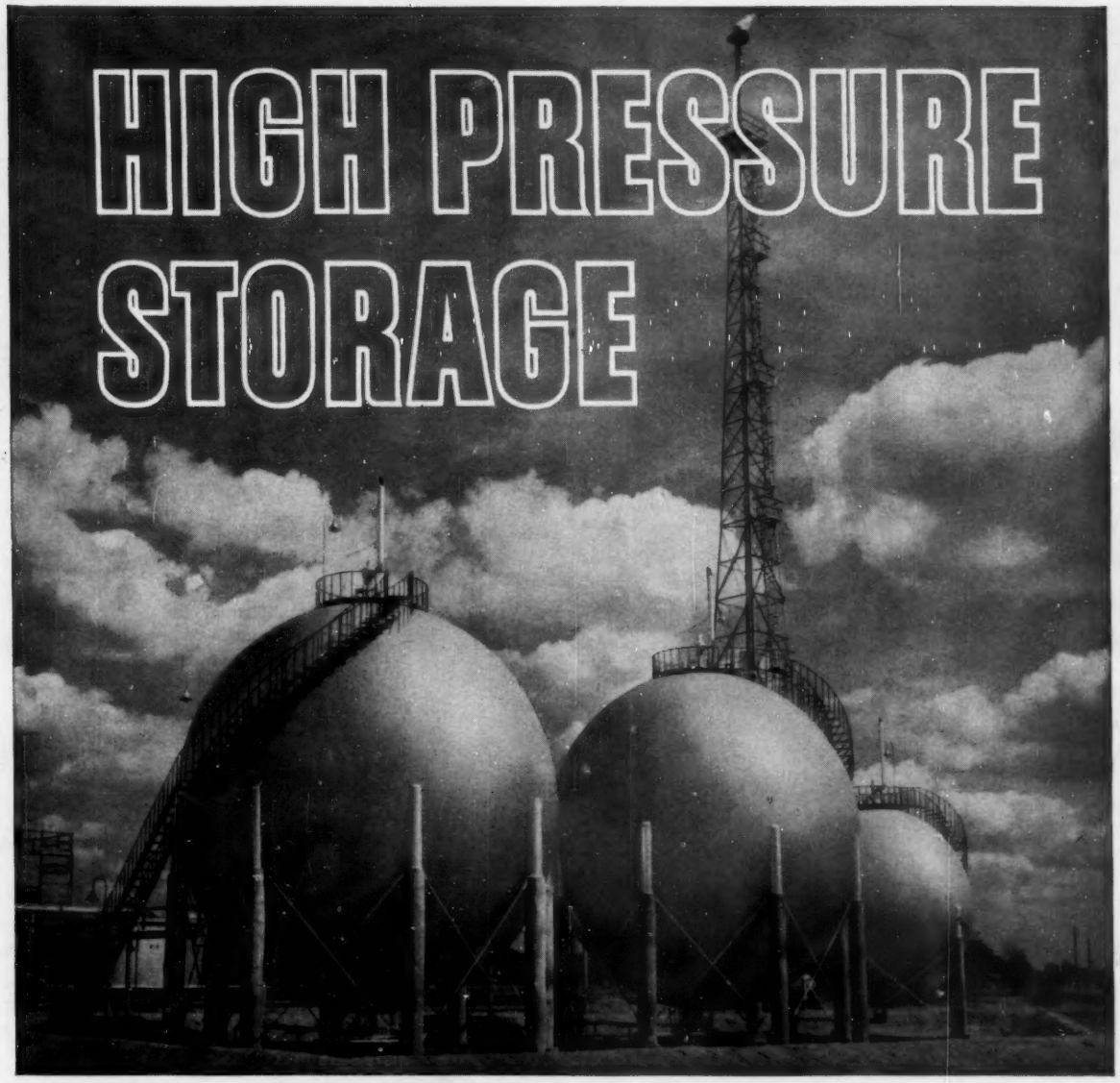
Now being formulated, the program will define for consumers the meaning of U.S. Dept. of Commerce's Commercial Standard C. S. 168-50 (dubbed Standard of Quality). Too, the drive will seek to orient consumers to purchase only tile that meets USDC specifications.

•

Colorful Promotion: Smith, Kline & French Laboratories, one of the pioneers in promotion by closed-circuit TV, is adding a mobile, color-TV studio. Costing about $200,000, the traveling color unit will enable SK&F's color-TV section to make medical colorcasts of clinical and surgical demonstrations from any hospital in the country.

No More Sad Sacks

MULTIWALL SACKS damaged in transit will be a thing of the past if a new container developed by International Paper Co. lives up to expectations. The container, a telescoping cardboard unit, allows easy stacking as well as better handling with plant equipment. Two of the approximately 1,500-lb. units can be unloaded from freight cars at once, and six can be stacked on top of one another without fear of swaying. Photo shows new (*left*) and old methods.



GRAVERSPHERES

solve gas and liquid storage problems

For pressure storage of process butane, iso-butane, natural gasoline and other volatile liquids and gases, Graverspheres are a "natural."

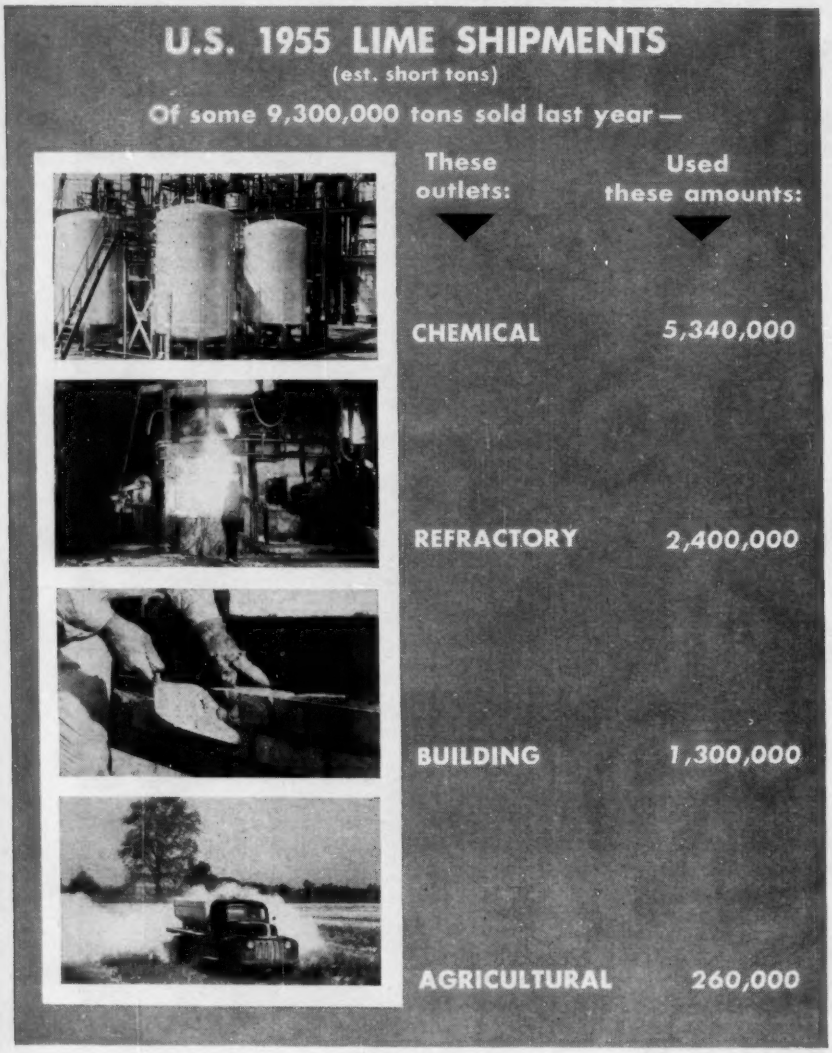
Graverspheres are formed in Graver shops and are first carefully assembled to insure accurate fit. After this they are shipped to location, erected and field-welded.

These spheres—the very shape of which is ideal for high-pressure storage in quantity—are available in capacities from 1,000 to 30,000 bbl. For gas storage Graverspheres are made to withstand pressures up to 100 p.s.i.g. and for liquid storage from 20 to 90 lb. water pressure.

As is the case with Graver tanks, towers and pressure vessels, traditional Graver quality and craftsmanship are inherent in Graverspheres.

GRAVER TANK & MFG. CO., INC.
EAST CHICAGO, INDIANA
CHICAGO • NEW YORK • PHILADELPHIA • EDGE MOOR, DEL.
PITTSBURGH • CLEVELAND • DETROIT • TULSA
SAND SPRINGS, OKLA. • HOUSTON • CASPER, WYO.
LOS ANGELES • FONTANA, CAL. • SAN FRANCISCO

GRAVER builds tanks, towers and pressure vessels for the chemical and petroleum industries



Lime's Mainstay: Chemicals

Total U.S. lime consumption is now well past the 11-million-ton/year level, second largest among the nation's big-volume chemicals.

And lime's chemical uses account for over 5.3 million tons of all shipments — more than all other outlets combined.

SURPRISING as it may be, chemical outlets—not agriculture and the building trades—generate the largest demand for lime. Right now, for example, some 57% of approximately 9.3 million tons of lime sold each year flows into chemical applications —and this 5.3-million-ton slice is boosted to about 7.3 million if captive lime output is counted.*

*Shipments include high-calcium and dolomitic materials (both hydrated and quick lime). Sales figures do not include about 2 million tons/year of captive lime produced by alkali, sugar, paper and other chemical manufacturers. Captive material considered, total U.S. lime consumption is well over 11 million tons/year, but still below the 14.7 million tons/year of sulfuric acid production.

All this runs counter to popular belief that lime requirements of agriculture and building are largest; actually these combined demands today constitute a minor outlet, consume less than 17% of all lime shipments.

Lime's present end-use pattern (substantially the reverse of what it was about 20 years ago) has escaped attention for several reasons:

- The switchover to predominantly chemical uses has been gradual and relatively free of attention-getting crises.
- Lime's multitude of chemical applications complicates attempts at market analysis.
- Other fast-developing industrial advances, by nature more glamorous, have overshadowed the steady growth of old-timer lime.
- A significant portion of all lime's chemical uses are related to peripheral industries, e.g., metallurgy, pulp and paper processing, water treatment. ("Chemical use" is defined by the U.S. Bureau of Mines as any application in which lime enters into one or more specific chemical reactions in various stages of a manufacturing process.)

Steel Supreme: Today, the top outlet for chemical lime is steel production. In '55, for example, steel plants consumed approximately 1.65 million tons of lime, largely as a flux in open hearth and electric furnaces; and it's a demand that is bound to grow steadily in proportion to the expanding steel output. Already, the steel industry is planning to boost ingot capacity by 3 million tons/year; and this indicates an increase of about 90 million lbs. of lime requirements, since about 30 lbs. of quicklime are needed to produce each ton of ingot steel.

There are, of course, other uses for lime in the iron and steel industry, e.g., in wire drawing and pig casting. And not included in the "chemical lime" tally is so-called refractory lime, or dead-burned dolomite (*see cut*), used to protect the brick linings of steel furnace bottoms.

Second largest consumer of chemical lime is the pulp and paper industry with an annual demand of 900,000 tons. Although some quicklime goes into the sulfite process (for preparation of calcium bisulfite), the main pulp-making application is in the sulfate process as a causticizing agent.

we never underestimate the creative in construction...

Building petroleum refineries, petrochemical and chemical plants requires complete understanding of practical construction techniques. You know, and we know, that there is no substitute for experience, a thorough knowledge of tried-and-proved methods, in this business. But, there is an important something beyond this, too.

It is the "creative sense" ever present at Procon, the constant seeking for better, more practical, more economical ways to build the most efficient installations for our clients. We are ready to apply this creativeness to your construction problems.

PROCON *Incorporated*
1111 MT. PROSPECT ROAD, DES PLAINES, ILL., U.S.A.

PROCON (*Canada*) LIMITED
TORONTO 16, ONTARIO, CANADA

PROCON (*Great Britain*) LIMITED
LONDON, W. C. 2, ENGLAND

WORLD-WIDE CONSTRUCTION FOR THE PETROLEUM, PETROCHEMICAL, AND CHEMICAL INDUSTRIES

OBJECTIONABLE
ODORS
CAN BE CONTROLLED!

Through use of the correct aromatic compound, objectionable industrial or product by-odors can be made inoffensive **easily, effectively and economically.** As pioneers in the field of industrial odor control, we can give you helpful assistance toward the elimination of almost any unpleasant or sales-retarding odor with which you may now have to contend. What is your odor problem? Write us in detail and we'll help you solve it.

FRITZSCHE Brothers, Inc.
Established 1871
PORT AUTHORITY BUILDING
76 NINTH AVENUE, NEW YORK 11, N.Y.

Methylene Chloride
Tricresyl Phosphate
Dioctyl Phthalate
Di-isooctyl Phthalate
Dibutyl Phthalate
Butyl Decyl Phthalate
Didecyl Phthalate
Chloroform, Tech.

Manufactured by
KOLKER
CHEMICAL CORPORATION
600 Doremus Avenue, Newark 5, New Jersey
Telephone – Market 2-4085

In all the pulp processes, however, lime is the raw material used to make calcium hypochlorite, one of several important bleaching agents.

Manufacture of calcium carbide takes considerable lime—some 675,000 tons last year, for example; and it's an outlet certain to grow steadily since carbide is the starting material in the manufacture of acetylene and calcium cyanamide.

The manufacture of other chemicals in '55 required the use of about 175,000 tons of lime; some important products were ethylene glycol, bleaches, calcium phosphates, chrome chemicals, precipitated calcium carbonate, explosives, wood distillation products, citric acid, pharmaceuticals, fine chemicals.

Nonferrous metallurgy provided an outlet for 350,000 tons of chemical lime. Some uses: flotation of copper and other ores; cyanidization of gold and silver ores; alumina sintering; magnesium manufacture; barium and vanadium processing; manufacture of ferrochrome.

Finally, the other large markets for chemical lime were: water treatment, 650,000 tons; glass making, 260,000 tons; and waste treatment, 140,000 tons.

A host of miscellaneous smaller-volume applications took the remaining lime shipments, and the approximate end-use pattern for '55 breaks down about this way:* insecticides and fungicides, 85,000 tons; leather tanning, 70,000; petroleum refining, 60,000; sugar refining, 40,000; food products, 40,000; paint and varnish, 35,000; coke and gas purification, 30,000; masonry units manufacture, 30,000; miscellaneous and unknown uses, 150,000.

Up and Coming: A relatively new application for lime, but one that may grow to be very important within the next few years, is soil stabilization. In fact, one spokesman for the industry predicts that lime used for this purpose—because it will be tied to the nation's forthcoming road-building program—may eventually exceed quantities going into mortar, could reach the 700,000-tons/year mark within a decade.

But lime's share of the soil stabilization market, however large it may eventually be, will be earned at the expense of several competing materials. Calcium chloride, for one, is also being promoted for this use; but the more intense competition will probably come from asphalt and cement.

Still another rapidly growing use for lime is the treatment of industrial wastes. Typical applications are: neutralization of various acidic wastes (e.g., chemical, plating, steel pickling, etc.); coagulation; treatment of textile and pulp mill wastes. However, the market for lime in waste treatment is necessarily keyed to local pollution abatement programs, because most industries treat waste only to the extent required by local ordinances.

But the big surprise to many is that agricultural lime has dropped to the bottom of the list of the four main categories. Farm consumption in '55 was a relatively small 260,000 tons, a million tons less than the amount used in building trades.

The reason, of course, is that there's a definite limit to the amount of lime that can be used on any particular kind of soil; in most cases, these limits have already been reached and maintained. Further additions of lime—unlike fertilizers—will not produce better crop yields.

Use of lime on the farm is not, of course, limited to soil conditioning. The chemical is also a vital component of two well-known fungicide mixtures—lime-sulfur sprays and dusts; Bordeaux mixtures.

But these uses are unlikely to change enough to materially alter total ag-lime needs.

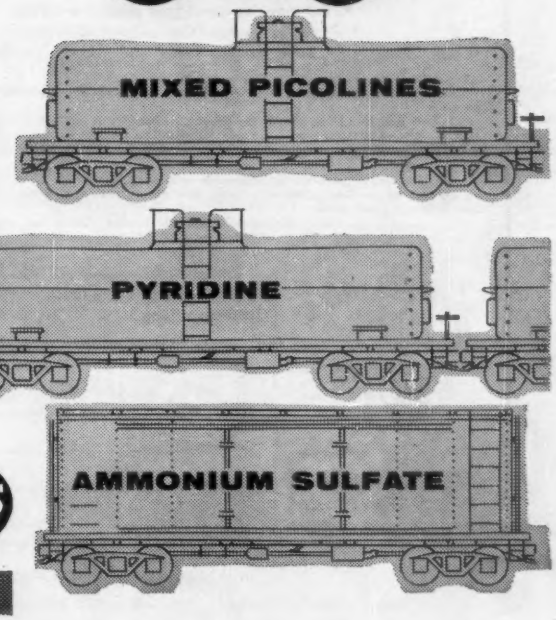
Too, the government's soil bank program—if it's adopted—may cut back agricultural lime consumption to even lower levels in the years ahead, since lime use is more or less proportionate to the acreage under cultivation.

Hence chemical and other uses must provide the expansion needed to keep lime consumption growing. But such outlets as waste treatment and soil stabilization notwithstanding, the future growth of the lime industry on the whole will be steady, not spectacular.

It is this characteristic steadiness of growth—the composite effect of a multitude of expanding outlets—that will continue to keep lime among the nation's top chemical raw materials.

*In some applications, the total quantities of lime used may be somewhat larger than indicated, since captive lime is excluded.

shipped to your needs
USS CHEMICALS



United States Steel offers prompt and efficient service on these chemicals

United States Steel has ten plants producing chemicals. When you order your chemicals from U. S. Steel, you are assured of service and shipment to meet your production needs. For more information, contact our nearest Chemical Sales Office, or the United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

See "THE UNITED STATES STEEL HOUR"—Televised alternate weeks—Consult your newspaper for time and station.

USS Chemicals

6-05

UNITED STATES STEEL

SOLVENTS

ACETONE
ALCOHOL, PROPRIETARY SOLVENT
AMYL ACETATE
BUTYL ACETATE
CARBON BISULFIDE
CARBON TETRACHLORIDE
CHLOROFORM
ETHYLENE DICHLORIDE
ETHYL ACETATE
GLYCOLS
ISOPROPYL ALCOHOL
"McKESSOL" PROPRIETARY SOLVENT
METHANOL
METHYLENE CHLORIDE
PERCHLORETHYLENE
PROPYLENE GLYCOL METHYLETHERS
TRICHLORETHYLENE
TRICHLOROETHANE

- *Nationwide distribution*
- *Tank cars, car loads, truck loads and drums*

MK

McKESSON & ROBBINS
INCORPORATED
CHEMICAL DEPARTMENT
Nationwide distributors of heavy and fine chemicals

Boston • Burlington • Cedar Rapids • Chicago • Cleveland • Dallas • Davenport • Decatur
Des Moines • Detroit • Houston • Los Angeles • Milwaukee • Mobile • New York • Omaha
Peoria • Philadelphia • Phoenix • St. Paul • St. Louis • San Antonio • San Diego • Wichita

McGraw-Hill Mailing Lists Will Help You

- Merchandise your advertising
- Conduct Surveys
- Get leads for your salesmen
- Get inquiries about your product or service
- Pin-point geographical or functional groups
- Sell Direct
- Build up weak territories
- Aid Dealer Relations

Direct Mail is a necessary supplement to a well rounded Business Paper Advertising program.

600,000 actual names of the top buying influences in all the fields covered by the McGraw-Hill publications make up our 150 mailing lists. These are built and maintained primarily for our own use, but they are available to you for Direct Mail purposes. Pick out a list of YOUR prospect from our Industrial Direct Mail Catalogue.

More and more, progressive companies are using Industrial Direct Mail regularly as an advertising medium. They effectively allocate a portion of their concentrate on the best business publication.

For complete, detailed information about our service, fill in the coupon or write for your copy of our free Business and Industrial Direct Mail catalogue.

Direct Mail Division, McGraw-Hill Publishing Co., Inc.
330 West 42nd St., N. Y. 36, N. Y.

Please forward my free copy of the McGraw-Hill "Industrial Direct Mail Catalogue."

Name_____

Company_____

Address_____

City_____ State_____

Frost on Perfume

Hard hit by the cold spell in Europe is the French perfume industry—and what the almost inevitable effects will be, dollarwise, is a chilling thought to U.S. perfumers. Virtual destruction of the French perfume crop is now reported by foreign industry spokesmen, some saying that it may take 15 years to get back to normal.

But perfumers in this country maintain that the extent of damage, and its lasting effects, cannot be fully evaluated yet, emphasize that the French are trying to capitalize on the scare-value of the situation, with an eye to pushing prices sky-high.

Hardest hit are the plantations at Grasse, France, where damage is estimated at $4 million. The subzero weather reportedly killed 220,000 of 260,000 newly planted trees, almost totally destroyed the bitter (Seville) orange tree orchards. Consequently, instead of the usual 1.75-million-lb. harvest of scented fruit, the Grasse producers will be lucky to get 50,000 lbs. this year.

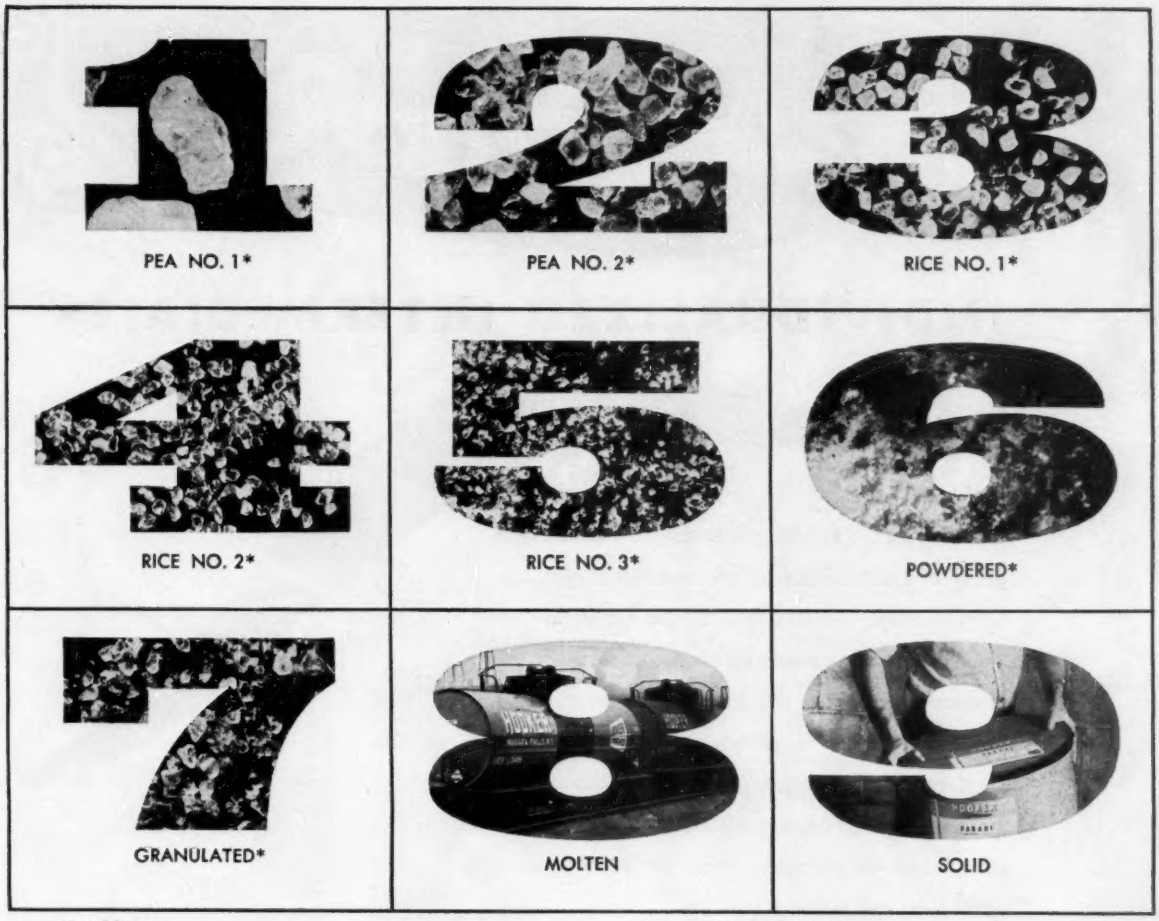
The Grasse plantations, leading producers of essence of orange flowers (neroli oil), have a normal output of 2,200 lbs./year. But these firms also handle 1,320 lbs./year of Egyptian and Sicilian orange flowers; and these supplies, too, have been curtailed by cold-weather damage.

Other types of perfume materials may also be affected (e.g., rose de mai, jasmine, and possibly lavender); but because these plants flower later in the season, it's not yet known whether they have been damaged.

It's obvious that synthetic materials will have to substitute for neroli oil, at least; and the big question is: Will this be a golden opportunity for synthetics to replace natural scents? Apparently not: though synthetics have a price advantage, the natural materials are preferred, quality-wise.

As one U.S. perfumer put it, the makers of synthetic essences had a big chance once before, during World War II, but didn't make much of it. They continue to blend artificial scents with the natural materials for cost-cutting purposes.

More immediately, then, the European perfume crisis will merely force buyers to dig deeper in their pockets when buying such natural materials as may still be available.



*Actual Size

9 ways to make money with paradichlorobenzene

Going to market this year with a line of paradichlorobenzene products?

We'd like to help you do it, successfully.

How? By furnishing any of the sizes you need, economically from *one* source.

You can get PARADI® (100% pure Hooker paradichlorobenzene) to match all these requirements:

Repackaging The three sizes in the top row, above, offer you a ready-made, balanced "line." These uniform, sparkling crystals sublime completely, without stain or residue.

Molding or compressing The *next* three sizes above will give you a firm, dry block or pellet of exceptional brilliance. *Rice No. 2* flows very freely, so is ideal for automatic presses where dies must be refilled rapidly. *Rice No. 3*, slightly smaller, is sized especially for foot-operated presses. It's free-flowing, yet packs with very little effort. And if you melt-and-mold, consider *Powdered*—a fine, fast-melting size that's easily colored and perfumed.

Agricultural selling You'll find *Granulated* a handy bulk-package size. It's often recommended for broadcasting as a weed-killer, and in control of certain insects and fungi.

Molten—and solid, too Do you use 50 or more tons per month? You may save by grinding and screening PARADI yourself. You can buy *molten* PARADI for this purpose, in tank cars—or *solid* PARADI, cast into drums.

Screened sizes are packed in fiber drums—25, 50, 100 or 200 lbs. net.

See for yourself how PARADI helps you put maximum sales appeal into your product, and lightens your processing or repackaging job. Write today on your business letterhead for literature and samples of the sizes that match your needs.

From the Salt of the Earth

HOOKER CHEMICALS

HOOKER ELECTROCHEMICAL COMPANY

3 FORTY-SEVENTH STREET, NIAGARA FALLS, N. Y.

NIAGARA FALLS • TACOMA • MONTAGUE, MICH. • NEW YORK • CHICAGO • LOS ANGELES

S-2130

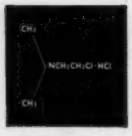
specially prepared

INDIVIDUALIZED INTERMEDIATES

DIALKYL AMINO ALKYL CHLORIDES provide a versatile group of intermediates for pharmaceutical synthesis. Continuously produced by Michigan Chemical Corporation for many years, individual members of this intermediates family provide manufacturers with a convenient method for introducing the dialkyl amino alkyl radical into organic nuclei to produce substituted amines, esters, and ethers. All are available in commercial quantities. Write for samples, technical data, and prices.

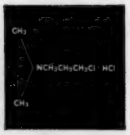
for pharmaceutical synthesis

beta-Diethylaminoethyl Chloride Hydrochloride. (DEC). $(CH_3CH_2)_2\ NCH_2CH_2Cl.\ HCl$. A granular solid. Specially suited for use as an intermediate in organic chemical manufacture, including the production of antispasmodic agents and other pharmaceuticals.



beta-Dimethylaminoethyl Chloride Hydrochloride. (DMC). $(CH_3)_2\ NCH_2CH_2Cl.\ HCl$. A granular solid. Specially prepared for use in manufacture of antihistaminics and other pharmaceuticals. Other potential uses in organic synthesis. Relatively non-toxic in hydrochloride form.

beta - Dimethylaminoisopropyl Chloride Hydrochloride. $(CH_3)_2\ NCH_2CHClCH_3.\ HCl$. (DMIC). An organic intermediate similar in appearance and properties to DEC and DMC. Specially prepared for manufacture of analgesics and other pharmaceuticals. Other potential uses in organic synthesis.



gamma - Dimethylaminopropyl Chloride Hydrochloride. $(CH_3)_2\ NCH_2CH_2CH_2Cl.\ HCl$. (DMPC). A white powder of singular purity. A versatile intermediate for pharmaceutical and organic syntheses, available exclusively from Michigan Chemical.

Other widely used intermediates supplied by Michigan Chemical Corporation include Hydrobromic Acid, Methyl Bromide, Ethyl Bromide, Monobromobenzene, Trimethylene Chlorobromide, Phosphorous Tribromide and Cyclopentyl Bromide. Write for booklet "Individualized Intermediates."

MICHIGAN CHEMICAL CORPORATION

*Trademark

504 Bankson Street, Saint Louis, Michigan

C-55-1

EASTERN SALES OFFICE: 230 Park Avenue, New York 17, New York

BASIC MANUFACTURER OF INDUSTRIAL, PHARMACEUTICAL AND AGRICULTURAL CHEMICALS

Market
Newsletter

CHEMICAL WEEK
March 17, 1956

What you've been hearing about some ethyl alcohol prices going up isn't just idle gossip. Effective April 1, ethanol schedules will be hiked 3¢/gal. on drum lots to widen the spread between tank-car and small-quantity prices. It's the first time in several years that the spread has been changed, and reportedly is now justified by rising costs of containers, labor and freight.

New tabs on 190-proof alcohol, in drum lots, will be: c.l., 58¢/gal.; l.c.l., 63¢/gal. Tank-car quantities remain unchanged at 42¢/gal.

And hand-in-hand with alcohol, acetone prices will also go up. These increases confirm a recent prediction of such a move (*CW Market Newsletter, Jan. 28*), then based on acetone's obvious swing to a better supply/demand balance from last summer's "too plentiful" market condition. Officially, however, the same reasons for the boost apply to acetone as to alcohol.

The increase on drum lots, both c.l. and l.c.l. amounts, to 1½¢/lb., sets the tabs at 10.5¢ and 11.5¢/lb., respectively. Tank prices, in this case, may go up a cent to 8¢/lb.

Other organics that will carry higher tags on April 1 are butyl alcohol, butyl acetate, and ethyl acetate. Drum prices will be up ½¢/lb. pushing the two butyls to 16¢/lb., ethyl acetate to 14¢/lb.

•

World consumption of synthetic rubber will set a record high this year, exceed the '55 demand by 100,000 tons (about 10%), according to prognostications by B. F. Goodrich President W. S. Richardson.

However, total U.S. consumption of all types of new rubber—natural as well as synthetic—will probably decline about 4% from last year. The reason: expected drop in automobile production. Nonetheless, demand for man-made rubber in this country in '56 is expected to reach 905,000 tons, 12,000 tons more than last year. Meanwhile, demand for tree-grown rubber will drop to about 550,000 tons, 80,000 lower than last year.

And in the rest of the free world, too, use of man-made rubber is expected to climb. Consumption in these areas in '54 totaled 103,000 tons; in '55, some 162,000 tons; and this year will probably expand to approximately 250,000 tons.

Predictions of longer-range world rubber requirements—this time by P. W. Litchfield of Goodyear Tire and Rubber—also indicate a cheerful future for man-made rubber.

Within the next five years, he says, demand for new rubber—both natural and synthetic—will rise to 3.5 million long tons/year, or more than 600,000 tons over the current consumption rate of about 2.89 million tons/year.

Concludes Litchfield: large increases in the natural rubber supply cannot be made in time to meet these demands, hence the growing requirements for raw rubber will have to be met by expansion of synthetic rubber plants.

•

This month's newcomer to the ammonia scene ups the producer tally to 44, leaving 10 more plants due by next year. Now onstream is Sun Oil with its $10-million unit at Marcus Hook, Pa.

Total output of the Sun Oil plant—some 300 tons/day when operating at full capacity—will be sold; 75% will go to the chemical industry, 25% to agricultural buyers.

Incidentally, anhydrous ammonia is the second completely nonhydrocarbon product to be made at the firm's refinery; production of the first, elemental sulfur, started last fall.

•

More technical-grade methyl acetate is available due to a 50% increase of production capacity by Borden's Chemical Division. Methyl acetate—the lowest priced (95%, 8¼¢/lb., tanks) ester currently produced in commercial quantities—not only is a widely used chemical intermediate and solvent, but also can be used as a replacement for acetone or ethyl acetate.

•

Once again isophthalic acid production is imminent at the new 50-million-lbs./year Richmond, Calif., plant of Oronite Chemical. Due last October—but twice delayed since then (*CW, Dec. 10, '55, p. 92*)—onstream date now is April 1.

Price of the isophthalic, which will be highly competitive with phthalic anhydride, is 23¢/lb., c.l. or truckload, f.o.b. Richmond; however, charges will be freight-equalized to the nearest phthalic anhydride plant.

•

Chemical exports from West Germany—up 15% last year—represented close to a quarter of the country's total chemical sales. Industrial chemicals and fertilizers made up the bulk of the shipments. Plastics, third in order of importance (exceeding pharmaceuticals and aniline dyes), accounted for 9% of the chemical exports—up from 6.5% in '54.

West German imports of chemical goods, on the other hand, climbed 28% last year. Contributing to the growth were: industrial chemicals (up 54%), man-made fibers, pharmaceuticals, plastics.

But the fact that tar dyestuff imports rose by 42% is held especially remarkable since domestic productive capacity of these materials was only partly used.

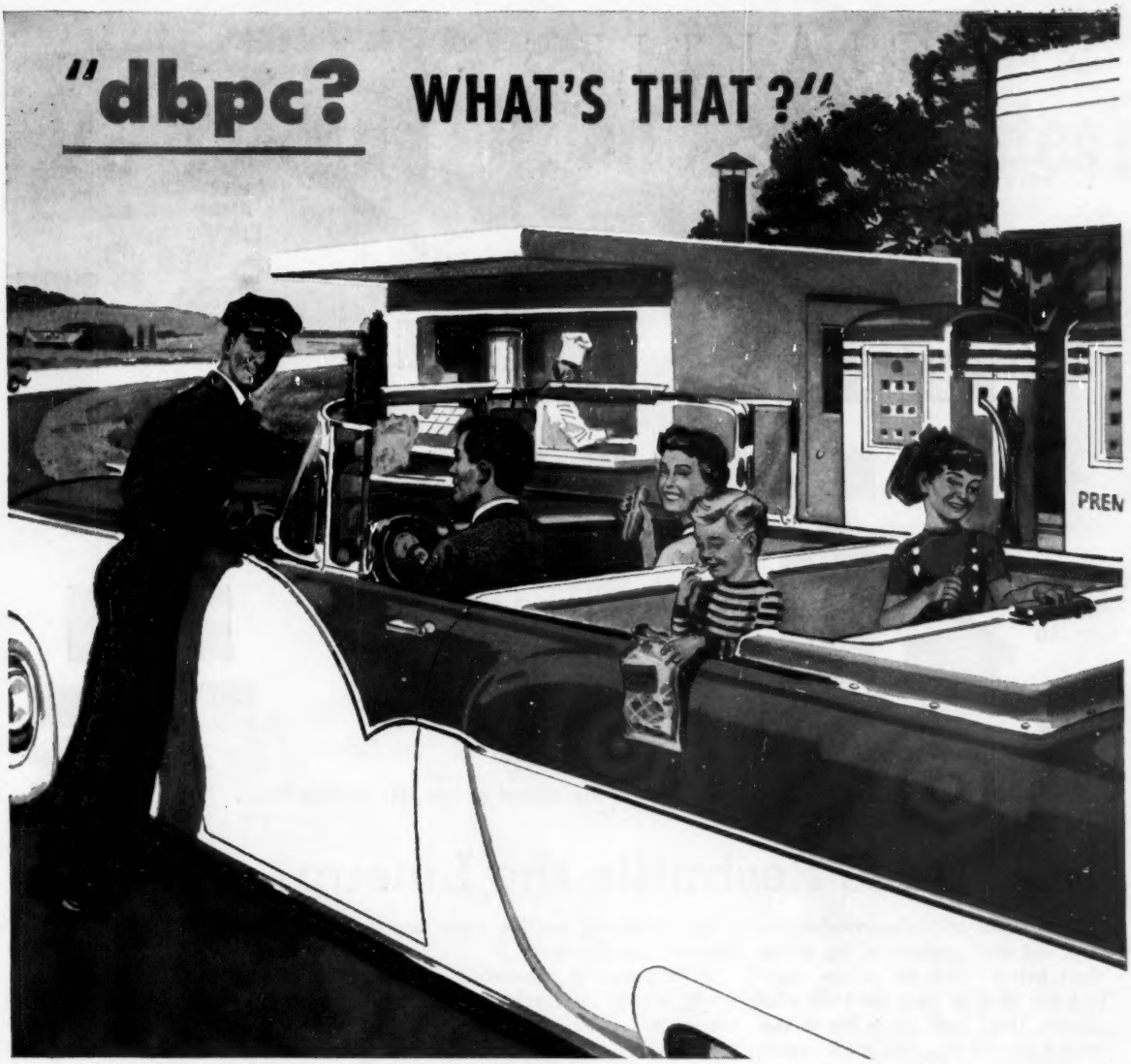
Yugoslavia's 1956 export targets—announced by the Yugoslav Foreign Trade Administration—include the following items of particular interest to the chemical industry: sodium hydroxide, 24,000 tons; sodium carbonate, 10,000; calcium carbide, 11,000; polyvinyl chloride, 1,800; mercury, 385; chromium ore, 19,100; chromium concentrates, 35,000; silver, 70; pyrites and pyrites concentrates, 180,000.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending March 12, 1956

	Change	New Price
UP		
Cresylic acid, petroleum, 200-222 C., tks.	$ 0.03	$ 0.65
Sodium metasilicate, pentahydrate, bgs., c.l., wks., 100 lbs.	0.15	4.25
Sodium silicate, liq., 40-degree Be., turbid, dms., c.l., wks., 100 lbs.	0.10	1.45
DOWN		
Casein, Argentine, grd., bgs., c.l., duty pd.	0.005	0.265
Mercury, metal, 76-lb./flask, net flask	2.00	264.00
Sodium glutamate, mono, dms., c.l.	0.04	1.20

All prices per pound unless quantity is stated.

"dbpc? WHAT'S THAT?"



Sir, **dbpc**® is Koppers trademark for di-tert-butyl-para-cresol — one of the most versatile antioxidants in use today.

For example, it plays a vital role in your automobile engine. For less than one hundredth of a cent a gallon it protects gasoline against sludging, and prevents deposits from accumulating in your engine, reducing its efficiency.

Your white sidewall tires could owe their continuing whiteness to **dbpc** since it prevents discoloration in light colored rubber. And that applies to foam rubber seats and light rubber trim, too.

Take those hot dogs you're eating— **dbpc** antioxidant could have been used to protect the sausage casing against discoloration, or to keep the shortening in the bun from turning rancid. The wax paper in Junior's potato-chip bag could contain **dbpc** antioxidant since it effectively stabilizes paraffin wax against deterioration in color and odor.

Your little girl's plastic toy might be **dbpc**-protected against undesirable chemical changes which cause discoloration. And even your wife's oil-based cosmetics such as lipstick and face cream depend on **dbpc** for protection against color and odor changes.

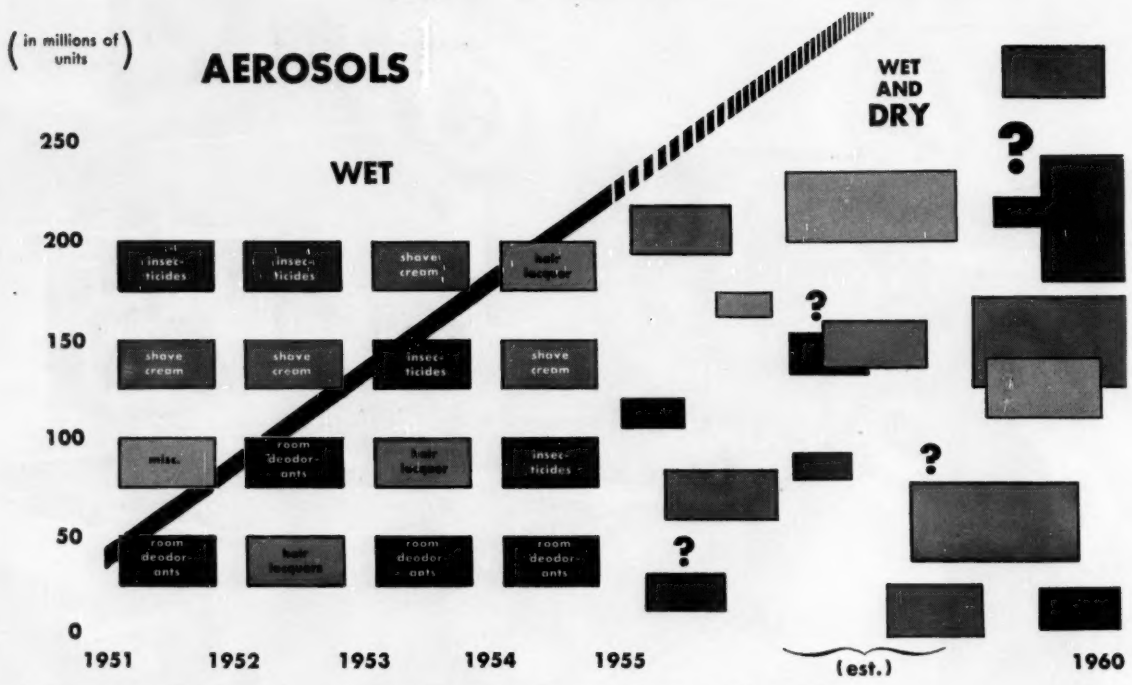
For more detailed answers to the interesting question, "What's **dbpc**?" write to Koppers Company, Inc., Chemical Division, Dept. CW-3176, Pittsburgh 19, Pennsylvania.

KOPPERS®

KOPPERS CHEMICALS

SALES OFFICES: NEW YORK • BOSTON • PHILADELPHIA • ATLANTA • CHICAGO • DETROIT • HOUSTON • LOS ANGELES

In Canada: Dominion Anilines and Chemicals Ltd., Toronto, Ontario



AEROSOL SALES: On the eve of the first burst of dry aerosol activity, the question is . . .

Will Dries Reshuffle the Lineup?

Before you try to unscramble the "wet and dry" segment of the above chart, here's a hint: the picture won't look too different from the 1955 sales picture. Don't look for a jog in the aerosol growth line, and don't expect to find a dry aerosol among the top four.

But the next few months will see the first real burst of dry aerosol activity—in pharmaceuticals and personal toiletry items.

No dry aerosol on the market now has all the earmarks of a big comer, with the possible exception of the dry ("nontoxic") fire extinguishers. Fire Chief, a product of Martin L. Straus II's Marlowe Chemical Co. (New York) is going into big promotion now. Straus, who is known for his backing of spectacular items (Eversharp-Schick, Tintair), should be able to make a splash with his bicarbonate of soda fire-killer. His talking points will derive from the public distrust of carbon tetrachloride (active ingredient of liquid aerosol extinguishers) and the ease in cleaning up the dry powder.

But Straus's promotion plans face possible complications:

- Proportion of propellent to product is critical for maximum evacuation of the dry extinguishers. Formulation-wise but promotion-quiet competitor, Safe Chemicals Co. (Marinette, Wis.) may step up competition.
- The product's short actual fire-fighting life—4-8 seconds under optimum conditions—may discourage some buyers.
- The public's traditional resistance to home fire extinguishers is hard to whip.

No Valve Worry: By being one-shot propositions, the fire extinguishers evade the big technical question confronting the other new dry products: the valve problem. The extinguishers currently use a variation of the foam type of valve, designed to release all the product at one push of the button.

The powders can cause valve trouble for products that get intermittent use. Particles of product wedge between the valve and its seat, holding it open and allowing the propellent to escape.

Two aspects of the dry form make it susceptible to this trouble: particle size, and the fact that it isn't dissolved, but merely suspended, in the propellent. Because of this, the valve must be more carefully crimped on, too, lest the propellent escape.

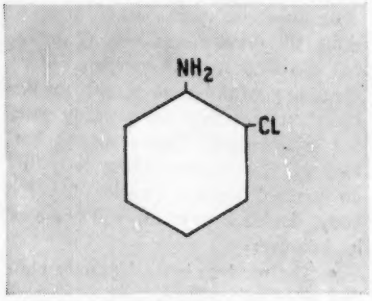
Work on perfecting the dry valve has mostly involved getting a high seating pressure, a sharp cutoff, and hard seats for crushable particles, resistant rubber seats for hard particles.

When the right valve comes along—at a low enough price—it will open up a flood of new products. Precision Valve Corp. (Yonkers, N.Y.) says that "10 companies in 10 different fields" are waiting for it to finish developing its powder valve.

At the present time Risdon Mfg. Co. (Naugatuck, Conn.) has what the industry generally believes is the best dry valve. Aeropak, Inc.'s (Chicago) valve was, with Risdon, one of the first, but Aeropak is, itself, dissatisfied with it, believes nobody has a thoroughly dependable one yet.

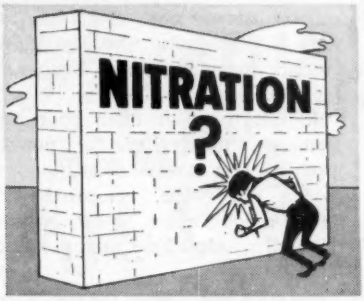
CAN YOU PASS THIS

30-Second Quiz on Intermediates?



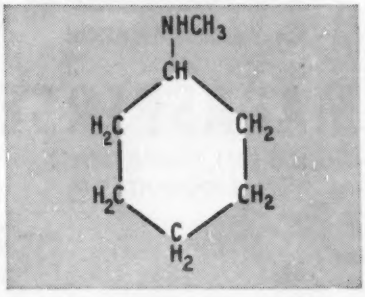
1. Du Pont o-Chloroaniline is currently used for:

- ☐ **A.** Preparation of fungicides
- ☐ **B.** Preparation of anti-oxidants
- ☐ **C.** No known uses



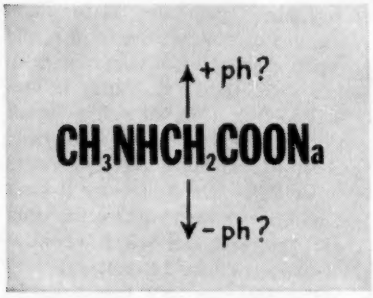
2. If you have a problem in nitration you should:

- ☐ **A.** Try Sodium Nitrate
- ☐ **B.** Pass the problem on to an unsuspecting friend
- ☐ **C.** Call on Du Pont for your nitrated products



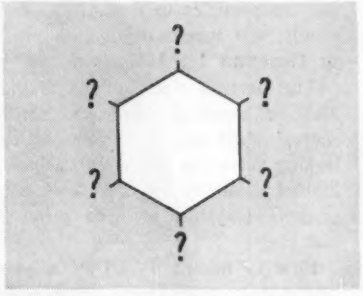
3. You can use Du Pont N-Methylcyclohexylamine as:

- ☐ **A.** A solvent
- ☐ **B.** An acid acceptor
- ☐ **C.** An intermediate



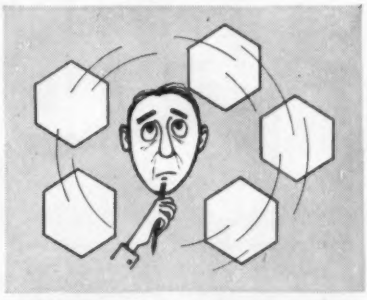
4. This is the formula for Du Pont Sarcosine. It is particularly interesting because:

- ☐ **A.** It displays both basic and acidic properties
- ☐ **B.** It is basic
- ☐ **C.** It is acidic



5. Suppose you have an unusual intermediate in mind. Your first move should be:

- ☐ **A.** Write Du Pont
- ☐ **B.** Consult Du Pont
- ☐ **C.** Call Du Pont on the phone



6. Granted there are a lot of intermediates to choose from. What's the best way to to find out about the one you want?

- ☐ **A.** Check all technical literature
- ☐ **B.** Write your problem up and send it to the ACS
- ☐ **C.** Write in to Du Pont

• Du Pont manufactures the greatest variety of intermediates offered by any chemical company and offers you help and advice on the use of any one of them. The quiz above gives some indication of the products and services available. Let's see how you made out on it: Answers: 1—A; 2—C; 3—A,B,C; 4—A; 5—Take your pick; 6—C.

There's a complete line of Du Pont intermediates containing nitro, chloro, amino and sulfo groups. Before attempting your own nitrations, chlorinations or reductions, it will pay you to consult Du Pont. Our resources are at your disposal in finding, or even in manufacturing, the intermediate you need.

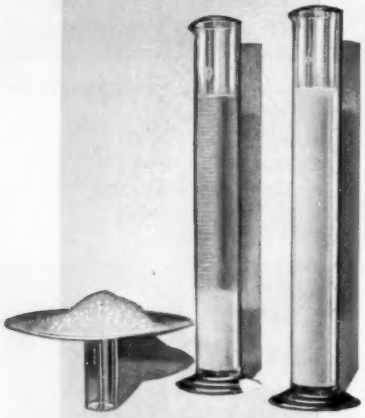
Just drop us a note, and let us try to help. Address: E. I. du Pont de Nemours & Co. (Inc.), Organic Chemicals Dept., Chemicals Div., Wilmington 98, Delaware.

DU PONT
REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY

ORGANIC CHEMICALS DEPARTMENT

RETARD
OR
PREVENT
THE SETTLING OF
FINE SOLID PARTICLES
IN WATER SUSPENSIONS
WITH
MARASPERSE
LOW COST, MORE EFFECTIVE
DISPERSANTS



The addition of only .05% to 3.0% of Marasperse disperses insoluble particles in water suspension and prevents agglomeration.

Viscous pasty masses become thin free-flowing fluids . . . Settling of suspended solids is prevented or greatly retarded . . . Slurries are kept fluid even with greatly increased concentration of solids.

Marasperse dispersants are non-hygroscopic, free-flowing powders — effective in both hard and soft waters.

Send coupon below for additional information on Marasperse products.

MARATHON Corporation
CHEMICAL SALES DEPARTMENT
ROTHSCHILD WISCONSIN

MARATHON CORP., ROTHSCHILD, WIS.
Send information on Marasperse Dispersants, File No. W-190, to:

NAME_____
COMPANY_____
ADDRESS_____

SPECIALTIES

Aerosol Research Co. (Forest Park, Ill.) has a valve and enlarged metering device that is successful at its job of releasing Minnesota Mining & Manufacturing Co.'s reflective paint, a product containing hard glass spheres, and it's now being applied to some dry products. Also figuring in current research is Oil Equipment Labs (Elizabeth, N.J.).

In spite of their often poor performance, the valves for powder products cost double what standard models do: 9-10¢, compared with 5¢ for a liquid valve. So far, incidentally, all powders have been pressure-filled.

Formulation: Some of the valve problems can be solved by special product formulations.

Caking and sedimentation of the powder is substantially reduced, it has been found, by selecting a propellent with a specific gravity near or greater than that of the product, allowing the particles to float. Most commonly, this means using 65% Freon or Genetron 11, 35% Genetron 12.

The particle size and shape must also be watched. Large or needle-shaped particles cause clogged and leaking valves, as do materials having limited solubility or crystalline components (crystals tend to grow on standing).

First to Boom: By all odds, pharmaceuticals look like best prospects for dry aerosol form. Though none has yet appeared commercially, the relatively high cost of drug products —to many consumers' minds—indicates that most users won't be startled by the substantial tag on the pressure-packed products. Nonetheless, because of the product's expense, the containers will have to be small before they can be sold to families. For this reason, the drug houses are looking at glass aerosols, particularly the plastic-coated container of Wheaton Plastics (May's Landing, N.J.).

For the drugs, the aerosol form shows some real advantages. For one thing, aerosols can deliver a drug sterile, right where it's wanted. Other pluses important to pharmaceutical houses are the aerosol's ability to keep water-sensitive materials in an anhydrous state, and to deposit a product uniformly.

Expected to be among the first powder pharmaceuticals in a pressure package are topical antibiotics, topical antiseptics, poison ivy remedies. Poultry raisers already have two: Merck's and Lederle's streptomycin sprays for respiratory diseases.

Costly Cosmetics: Though cosmetics, pharmaceuticals' companions in many drugstores, are often packed in costly units, the dry aerosols haven't proved out too well for this purpose. Many firms are working on them, but for the most part they are working without great hopes. Typical is the outlook of Max Factor, which is testing an aerosol talcum powder for the body, doubts if anything will come of it, because:

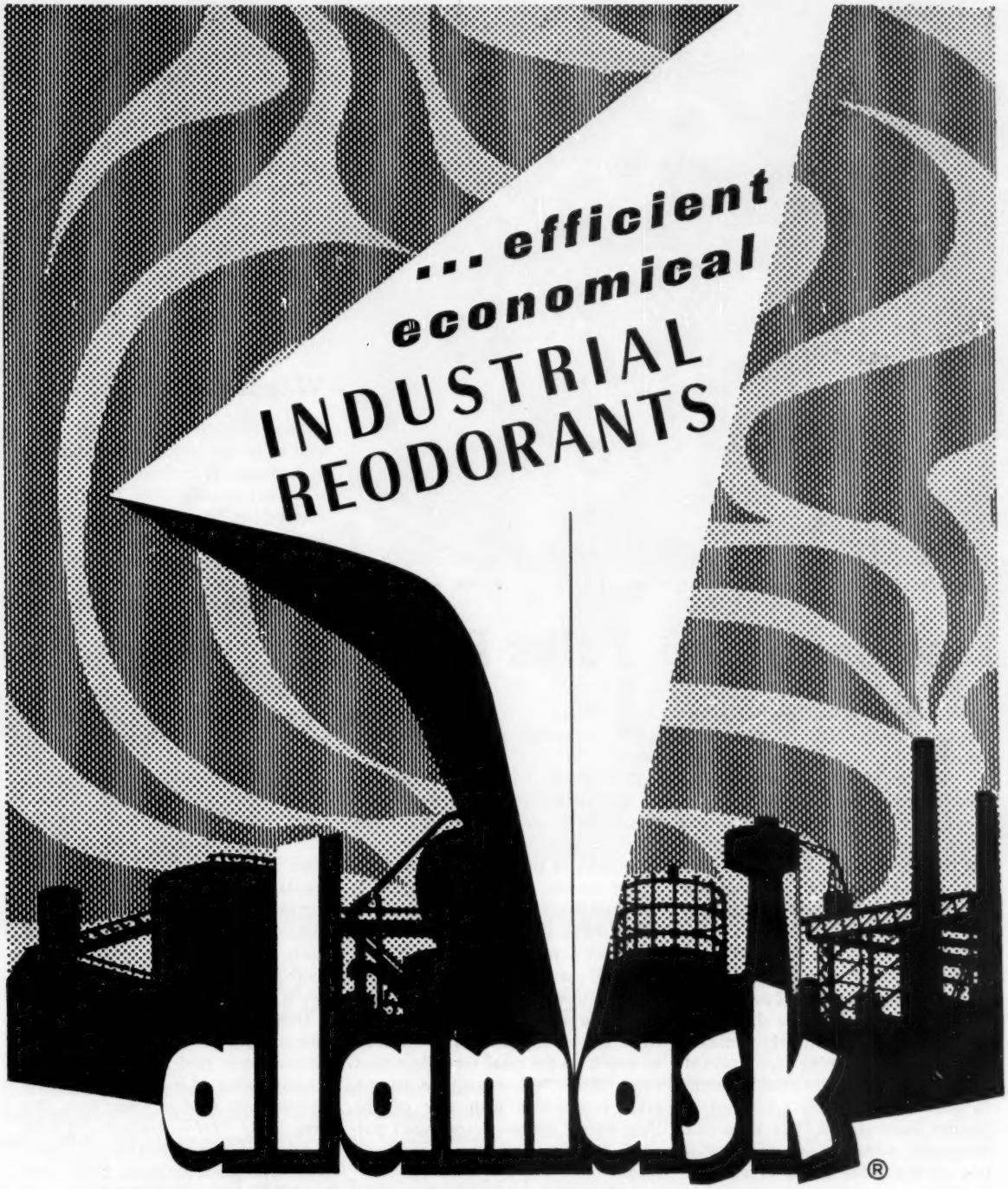
- The product is unpleasantly chilling when sprayed on.
- Hitting only one spot, the product has to be spread by hand anyway.
- Price is far above conventional talcs.

Price is the greatest depressing factor to cosmetic users, keeping even the idea's novelty appeal from making many sales. Costing over $1 for about 15 grams of powder, the form would have to show a lot of convenience to make a sale. James B. Varley & Sons (St. Louis) has missed selling Rexall on its combination foot and body powder (containing G-11) called Powder Puff—simply because it can't get its price down to where the drug chain figures it can sell it (Powder Puff costs $1.89 for 12 oz.).

Price may also be a key factor in the growth of industrial dry aerosols —except where ease of use can show a saving. Historically, the dry form began with an industrial specialty: IMS mold release agent, by Injection Molders Supply Co. (Cleveland), introduced in 1954 (*CW, June 12, '54*). Another out now is AP Parts Corp.'s (Toledo) dgf-123, which is a graphite lubricant.

As things stand now, the future of dry aerosols seems tied to the drug field. But when the valve and formulation problems begin to smooth out, you can expect labs throughout the nation to come up with novel ideas. The agricultural chemical field, for example, may be opened up by products like Du Pont's (Grasselli Division) soon-to-be-released garden insecticide powder.

And there is always the possibility that someone will devise a completely new product that will jolt the powder aerosol field as the hair sprays did the liquid field.



for masking Odors of

INDUSTRY

Incinerators • Dumps • Sewage Plants
Pulp and Paper • Petroleum • Fat Rendering • Canning and Vegetable Waste

MANUFACTURED PRODUCTS

Rubber • Plastics • Natural and Synthetic Latex • Petroleum • Inks and Oils
Sanitary Chemicals • Tall Oil • Paints

an "ALAMASK" for every purpose!

RHODIA INC. 230, PARK AVENUE NEW YORK 17, N. Y.

In Canada: NAUGATUCK CHEMICALS DIV., DOMINION RUBBER COMPANY, LTD. Montreal · Toronto · Winnipeg · Elmira

CLEAN UP: Travel boom sparks fight to get soap into hotels, where . . .

The Small Bar Talks Big

Last night, in hotel rooms across the nation, approximately 1.2 million travelers were shucking the wrapper off their individual-size soap bars. In motels (approaching the hotels in patronage), Pullman cars, on planes and ships, other millions washed up with the free small soap cakes. Soapmakers are finding that in travel-minded America, the small bars are fast finding a big market.

It's a market that is bound to grow. Travel is booming more each year, new hotels and hundreds of new motels go up each year. Even the size of the bar is bigger: the formerly common ½-oz. bar is now being supplemented by ¾-oz. and 1-oz. bars for the bath. In general, bigger bars are found in plushier hotels (some, like Houston's Shamrock, offer 2½-oz. bars). Motels, on the other hand, because of guests' shorter average stay, are staying with the ½-oz. size.

In spite of the high volume, the competitive situation (many firms bidding with highly cost-conscious hotel purchasing agents) and the high manufacturing cost (principally packaging) keep down the profit per bar. For the "Big Three" soapers, who offer consumer products, the business is looked upon largely as a part of promotion—getting samples of Lux, Palmolive, Dial, Camay, and Ivory soap (the principal brands found) before the public.

This activity doesn't necessarily have to be underwritten, however (although it may be by some). That money can be made is indicated by the number of makers of small bars without consumer brands. Chief among these is the Iowa Soap Co. (Burlington, Iowa), which supplies the bulk of the needs of the giant Hilton chain of hotels.

Payoff in Flexibility: These firms keep flexible, are able to supply custom-made soap products, with perfume, color, etc., specified by the hotel or motel. At the same time, they must keep volume high enough to offer a price competitive with that of the "Big Three" soaps—hotels won't pay much extra money for a tailor-made soap.

Rather than buy custom-made soaps, most purchasers of guest-size bars express their individuality on the wrappers. Most prices quoted include only the soaper's own logotype or a simple custom wrapper (with the name of the hotel). Many hotels or motels, however, like elaborate art work and multiple colors, for which they pay extra.

Prices of milled soaps (like Dial, Lux, Palmolive, Camay) range from about $14/1,000 ½-oz. bars, for one case, down to $12.25 or $12.50 on 100-case orders. The ¾-oz. size ranges from $17.50/1,000-bar case to $16 on 100/case orders. On 1-oz. bars, the range is $21 to $19.25. The 2½-oz. bar, packed 200/case, sells at $10.25 for one case, $10 on 100-case orders.

Prices are low, the profit small. But few promotional gimmicks can so plainly prove that they're self-supporting—and many soapmakers wish they had other campaigns that did equally as well.

Weeds and the River

Some 80,000 gal. of weed killer, said to be the largest single shipment of herbicide to leave the U.S. shores, will be unloaded from the freighter *Burckel* in Matadi, Belgian Congo, this week. Its purpose: to halt the threat of the water hyacinth, a fast-breeding aquatic weed already choking tributaries of the Congo River.

American Chemical Paint Co. (Ambler, Pa.) provided the herbicide, its Weedar formulation of 2,4-D. Special 5-gal. containers were provided for the chemical—the 80,000 gal. made up 35 truckloads—which will be distributed in small quantities to various spraying squads along portions of the 3,000-mile river.

As the main freight artery of the Belgian Congo, the river must be kept clear of weeds—the water hyacinth stands a poor chance of taking over the main stream, but it has clogged some of the tributaries. An armada of small craft has been assembled to spray the chemical along a 1,000-mile sweep of the river's branches.

Domestic Interest: Significant as the new role for 2,4-D is in Africa, local farmers have paid more attention to the marketing of a new herbicide by Carbide and Carbon Chemicals. It's Crag DCU 73W—chemically, 1,3-*bis* (2,2,2-trichloro-1-hydroxyethyl) urea. A pre-emergence herbicide, DCU 73W is designed to eliminate grasses in sugar beet fields, can be used at a $3.33/acre cost.

The new herbicide, contained in water solution, is sprayed on the crop row at planting time. Solution strength: 10 lbs. of herbicide to 50 gal. water. At the same time, a special attachment for the planter, developed by Howry-Berg Steel and Iron Works (Englewood, Colo.), mixes the herbicide solution into the top 2 in. of the soil.

CELANESE* VINYL PROPIONATE MONOMER

goes "tankcar!"

Full scale production of new monomer provides new source for homopolymers and copolymers with distinctive product-improving properties

Celanese Vinyl Propionate Monomer in volume clears the way for the commercial development of new emulsion paints, adhesives, laminates, plastics, synthetic rubbers, protective coatings and finishes.

Like Vinyl Acetate—first of the Celanese Vinyl Monomers—Vinyl Propionate copolymerizes with acrylics, maleics, styrene, butadiene, and most other vinyl monomers. It promises new product values for many fields.

You can get prompt delivery of Celanese Vinyl Propionate in drum lots to tankcar quantities. For samples and technical bulletin, write:

Celanese Corporation of America, Chemical Division, Dept. 652-C, 180 Madison Avenue, New York 16.

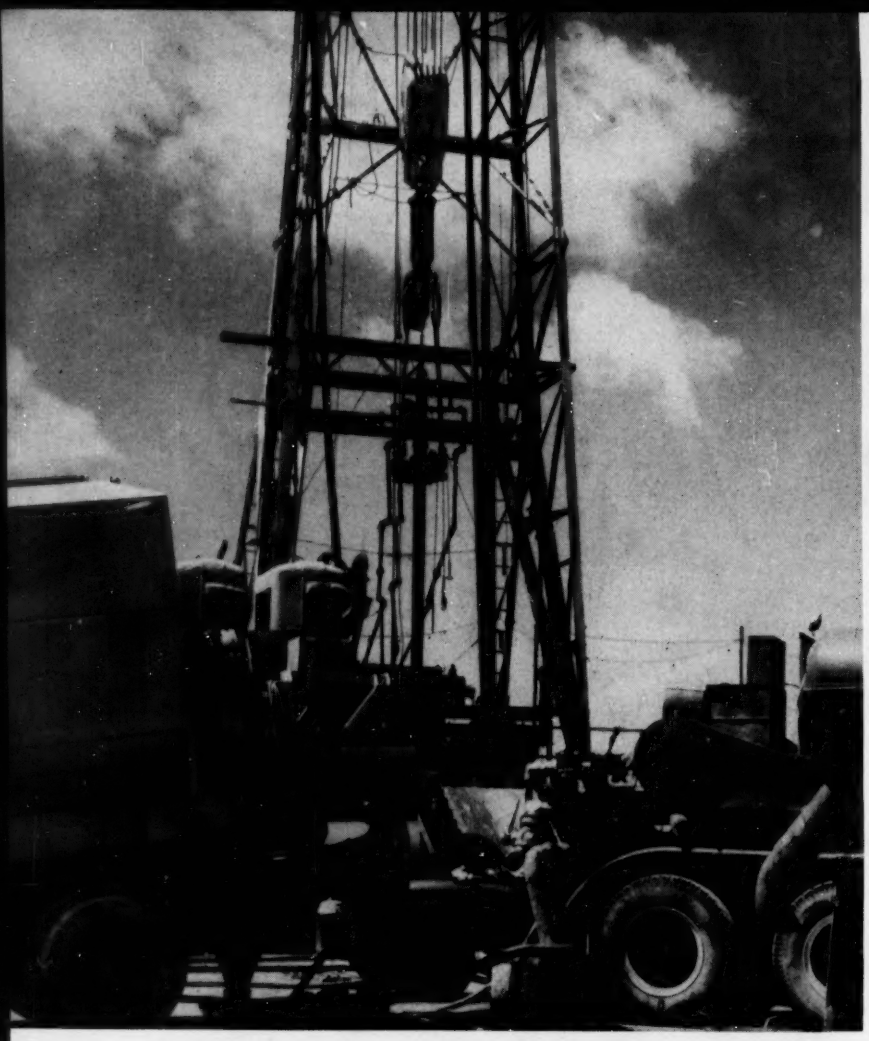
DESCRIPTIVE DATA

Distillation Range @ 760 mm, °C	Within 6° spread Including 94.9
Color APHA, max.	30
Aldehydes as acetaldehyde, % wt., max.	0.05
Water, % wt., max.	0.25
Specific Gravity @ 20°/20°C	0.9160-0.9185

CHEMICAL PROGRESS WEEK-APRIL 23-28

Celanese* CHEMICALS

*Reg. U. S. Pat. Off.



PETROLEUM WEEK

WELL CEMENTING: To bring up crudes, $40-50 million worth of cement.

Drilling for a Market

Considerably below 22,500 ft. deep last week, and still plunging downward, the world's deepest oil well lies beneath the lonely marshes of Plaquemines Parish, Louisiana. Of more interest to chemical firms than its record-setting depth, however, is the well's ravenous consumption of cement—already over 10,000 bags.

Tailoring the oil industry's portion of the U.S. cement output—a $40-50-million/year share—is proving a paying proposition for specialty cement firms. Now, new additives and new cements are eagerly being sought to improve properties (e.g., initial strength, workability, and corrosion-resistance), as well as to broaden applications of the cements.

Portland cement is the most widely used material, as it has been since wells were first cemented. But modifications are important now, and—to meet individual drilling conditions—virtually custom-made products are the rule rather than the exception.

Old Competition: In recent months, a number of new materials have appeared, with the emphasis on non-portland cements:

• Halliburton Oil Well Cementing Co. (Duncan, Okla.), largest firm in the business, has introduced its Pozmix 140 (to be used only at 140 F or above), a cement based on pozzolans*—cement components first known to the Romans, and long in disuse. The 140 cement is latest in a series of pozzolan cements—most of which had been mixtures of portland and pozzolans.

• Dowell Inc. (Tulsa, a Dow Chemical affiliate) has likewise come up with a nonportland material. Its Dexet is an expensive—compared with portland—compound of 35% inhibited phosphoric acid, with a viscosity controller (powdered aluminous material) and a setting-time controller (a powdered fluoride).

• Drilling Specialties Co. (Bartlesville, Okla., a Phillips Petroleum subsidiary†), on the other hand, puts its faith in a trio of additives: Diacel D is a diatomaceous earth additive, producing low-density cements with portland. Diacel LWL contains carboxy methyl hydroxyl cellulose (from Hercules) to reduce water loss, thicken

*Siliceous materials of volcanic origin. "Artificial" pozzolans are found as industry's fly ash, or produced by heating certain minerals. Both are useful in cements, and Halliburton utilizes both in its formulas. It is their action with hydrated lime that produces cementlike effects.

†Phillips is far from the only firm researching cements on its own. Witness the recent patent to Humble Oil (U.S. Pat. 2,736,661) for a modifier for portland cement.

Why Oil Well Cement?

THE HOLE BORED by an oil well driller is a ragged one. It often goes through a dozen or more different strata—soil, stone, brine, water, sand, gravel, mineral deposits. At various stages, as the mud-lubricated bit chews downward, drilling is halted, and the hole is "cased" with steel tubing (at each descending stage, a smaller-diameter pipe is used). Cement is employed to anchor the pipe in place.

On the first stage, it might be poured in from the top—the essential thing is to get the cement between the pipe and the rough, drilled hole. But in the later, deep stages, the pipe is lowered in, attached to previously cemented tubing. Cement, under high pressure, is then crammed down the hole, squirted out the deep end and diverted back up on the outside of the pipe—between the outside pipe wall and the ragged hole. This cement must often be "backed up" over a 1,000 ft. There, it has several vital roles: it holds the casing, prevents loss of drilling muds into porous strata, channels pressurized gas or fluids up through the casing, prevents drilled-through materials from plugging the hole.

Every week Harshaw produces carloads of catalysts, and every week we produce orders of only a few pounds for customers' experimental purposes. Whether your catalyst requirement is measured in tons or pounds, we have modern facilities for giving you exactly the catalyst you want. If you are in the experimental or development stage and need only a few pounds of your catalyst, call for our technical assistance; if you are in the production stage, call on Harshaw to produce any amount of catalyst you need. Our ability to produce will provide the catalyst . . . when you want it. If your mind's on catalysts, call Harshaw today.

HARSHAW produces carloads of catalysts *every week*

HARSHAW

Write for our free booklet, "Harshaw Catalysts"

HARSHAW CATALYSTS AVAILABLE IN 7 FORMS

- Tablets
- Powders
- Granules
- Extrusions
- Spheres
- Rings
- Flakes

THE HARSHAW CHEMICAL CO.

1945 East 97th Street, Cleveland 6, Ohio

Chicago 32, Ill.
Cincinnati 13, Ohio
Cleveland 6, Ohio
Detroit 28, Mich.
Houston 11, Texas
Los Angeles 22, Calif.
New York 17, N. Y.
Philadelphia 48, Pa.
Pittsburgh 22, Pa.

USE ACTIVATED CARBON FOR LIQUID TREATMENT?

NEW DEVELOPMENTS may be of interest to you. . . . EASIER FILTRATION . . . controlled particle sizes slightly coarser than powder have been developed for improved handling and easier filtration.

A variety of granular sizes are also offered if fixed bed percolation techniques are of interest to you.

Tell us about your filtration problems—let us submit samples for your consideration.

Write or call

BARNEBEY-CHENEY Company

CASSADY AT EIGHTH / COLUMBUS 19, OHIO

In Canada: BARNEBEY-CHENEY LTD., St. Johns, Quebec

A copy of this quick-reading, 8-page booklet is yours for the asking. It contains many facts on the benefits derived from your business paper and tips on how to read more profitably. Write for the "WHY and HOW booklet."

• • • • • • • • • • • • •

McGraw-Hill Publishing Company, Room 2710, 330 West 42nd St., New York 36, N. Y.

SPECIALTIES . . . . . .

cements. Diacel A has a sodium silicate accelerator to control setting over a wide temperature range.

Tough Target: The new materials, of such widely differing composition, indicate the broad range of materials tried by oil well cementers to achieve special qualities. As wells get deeper, drillers have had to lift standards for their cement materials. An ideal cement should have characteristics such as:

- Variable density — essentially lower than that of portland.
- Resistance to varying temperatures.
- Good corrosion - resistance—largely to sulfates.
- Easily modified setting time—fluidity until it is in place, high initial strength.
- High bond strength.
- Shrink- and cracking-resistance.

Portland's Problems: In meeting these specifications, portland has done fairly well. But it has shortcomings, and it is in short supply, as well. By itself (neat), it is generally used for first stages of cementing. Then it must be modified. Typically, calcium and sodium chloride are used to speed setting; calcium ligno-sulfonates to slow it down; bentonites, pozzolans, perlites and hydrocarbons to lighten it; barium sulfate or ferrophosphorus to boost its density.

Just what modifications are used, and when, is often the secret of the cementing company—they have their own formulas, as well as special equipment for rapid mixing and for forcing the cement down the hole, under pressure.

Facing the various oil well problems daily, cementers are in a good position to develop new materials. So far, it has been their lab and field work that has produced the most important new products—the major portland producers seem to leave that phase of cement development alone. But it could pay many specialties makers to examine the cement needs of the eager-to-try, able-to-buy oil industry.

PATENTS . . . . .

Fast Set: Du Pont's John Haslam has an idea that is intended to solve one big problem of high-speed printing—setting the inks before they smear or run. His suggestion (U.S. Pat. 2,732,799): make the ink with a polymerizable, polyhydroxy organic compound, which can be set by reaction with an ester of a metal-containing (titanium or zirconium) monohydric alcohol.

•

Under Pressure: A new hydraulic fluid developed for General Aniline & Film Corp. (U.S. Pat. 2,736,709) is essentially an alkaline buffering agent (alkaline borates, phosphates, phosphites) in a mixture of mono- and polymethoxy-1-alkanols.

•

Dirtproof: A method of preventing the soiling of fabrics has been worked out for Alexander Smith Inc. by Patrick Florio and Leo Rainard (U.S. Pat. 2,734,835). They add 0.003-0.054 oz. of metal-oxide particles (under 0.6 micron in size) per square yard of fabric. The oxides—a mixture of at least two is suggested—include those of aluminum, silicon, titanium, beryllium, cerium, zirconium, magnesium, zinc.

•

Nonchalking: A new organic automobile finish created by Du Pont's Ralph Wirshing (Detroit) relies on small amounts of oxidizers—alkali metal dichromates and alkali metal permanganates—to inhibit corrosion and chalking (U.S. Pat. 2,731,354).

PRODUCTS . . . .

On Top: For recoloring convertible tops, upholstery and seats in automobiles, "X" Laboratories Inc. (New York) has a product called "X" Fabric Coat. It's offered in 13 colors and two sizes—a 12-oz. aerosol ($2.95) and a quart paint can ($3.95). Fast-drying and water-repellent, the coat reportedly does not affect the texture of the fabric.

•

Air Cleaner: An all-purpose mixture of synthetic detergents designed for airplane washing is being marketed by Permatex Co., Inc. (Brooklyn, N.Y.). Called Airplane Wash, the product is said to suds well, rinse easily, not dull plane surfaces. The company claims further that it will perform equally well in hot and cold water. A 4-lb. tin sells for $4.80.

•

Fur Rubdown: A new method of cleaning synthetic furs (Borgana, Allegro, Fab-Fur, etc.) uses turkish toweling instead of sawdust or nut-

These two experts can help solve your methyl chloride and methylating problems

Our Messrs. Neuville and Zellner (left to right above) cover all the bases when it comes to methyl chloride application and the special field of methylation. They come by their particular specialties honestly. Since 1936 Ansul has been a constant and expanding source of supply for bulk methyl chloride in the domestic and export markets. In the field of methylation alone (Morrie Neuville's specialty) Ansul has successfully methylated more than 100 compounds.

The methylation laboratory at Ansul is equipped to take over a methylating problem of yours at any stage of development. Manufacturing facilities for producing commercial quantities of a methylated compound to your specification are also available.

As a major producer of methyl chloride, Ansul is prepared to supply you with quantities ranging from laboratory containers to cylinders of 100 pounds, 140 pounds, and 1,300 pounds. Tank cars of 40,000 pounds and 78,000 pounds are available. Delivery is prompt.

For general information about methyl chloride and its bulk application, write to Bob Zellner. Questions or just conversation relating to methylation should be addressed to Morrie Neuville. THE ANSUL CHEMICAL COMPANY, DEPT. C-12, MARINETTE, WISCONSIN.

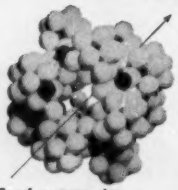
ANSUL

employment opportunities in the chemical process industries

• **Closing Date**—Each Tuesday, 11 days prior to publication date.

Linde
AND
MOLECULAR SIEVE ADSORBENTS
CHEMISTS — CHEMICAL ENGINEERS:

Unusual Career Openings in PRODUCT, PROCESS and APPLICATION DEVELOPMENT



LINDE offers an expanding development program in:
- adsorption
- separation of hydrocarbons
- purification
- catalysis
- test marketing and customer liaison
- process development and pilot plant design

We want B.S., M.S. or Ph.D. graduates, 0 to 5 years experience.

Send resume to:
Mr. P. I. Emch
P. O. Box 44
Tonawanda, New York
Refer to ad: CW-M

LINDE AIR PRODUCTS COMPANY
a division of
Union Carbide and Carbon Corporation

Sales and Technical Service Representatives

Expansion in petro-chemicals offers opportunities for chemically trained men with marketing experience. Challenging assignments are open. Age: preferably under 35. Salary: commensurate with ability. Location: Pittsburgh, Pa. Send details regarding qualifications and experience to:

Chemical Department
Gulf Oil Corporation
P.O. Box 1166
Pittsburgh 30, Pa.

ASSISTANT CONTROLLER

Full charge of all accounting for substantial new chemical company with challenging growth prospects. Design system, select staff. Must have heavy experience chemical or other process manufacturing accounting. Age limit 42. Starting salary $12,000 plus benefits. Five months New York City then permanently Savannah, Georgia. Send complete resumé with salary to

Controller,
SOUTHERN NITROGEN COMPANY, INC.,
270 Park Ave., New York 17, N. Y.

CHEMIST

Degree with inorganic major desirable. One to three years experience in analytical work or electro-plating—principally non-ferrous metal. Position involves work on anodizing, chemical brightening, and plating. Opportunity in expanding aluminum industry. Salary $5,400 up.

P9533 Chemical Week
520 N. Michigan Ave., Chicago 11, Ill.

ASSISTANT PURCHASING AGENT CONTAINERS AND PACKAGING

Excellent opportunity in head office for a man with extensive industrial experience in the procurement of all types of containers. Must be thoroughly familiar with packaging, packaging equipment and supplies, with knowledge of material handling. Administrative experience and negotiating ability important. Applicant must be able to coordinate related functions between departments, establish specifications, promote standardization, etc. Please submit complete resume and state salary desired. All replies held in strict confidence.

Personnel Department
American Cyanamid Company
30 Rockefeller Plaza
New York 20, N. Y.

ORGANIC CHEMIST

Immediate opening is available in the Process and Product Development Laboratory of our Petrochemical Plant for an experienced Organic Chemist. For this responsible position we are seeking a man with 5 to 10 years' experience in the field of solvents and plasticizers. Work will include laboratory and bench scale study of manufacturing techniques and product utilization in the plastics, lacquer, and related industries together with technical service contacts with plant operations, market development and sales groups.

Position offers advancement opportunity, good working conditions with modern facilities, and a liberal, well-balanced group of employee benefit plans.

Forward complete employment resumé together with a recent photograph, details concerning age, marital status, educational background and salary requirements. All replies will be held confidential.

Stanolind Oil and Gas Company
Employment Office
Box 1712
Brownsville, Texas

Positions Vacant

Marketing opportunities in Sales and Sales Development for chemist or chemical engineer at B.S. level, preferably with background in rubber or polymer field. Write details to P.O. Box 216, Torrance, California.

Wanted: Chemical Engineer with sales experience by well established manufacturer of filtration & process equipment. Salary & commission. Location: Eastern U.S. Excellent opportunity send complete resume of education and experience. The Eimco Corp. Eimco Building, 51 South St., N.Y.

Selling Opportunity Wanted

Oklahoma—Manufacturer's Representative needs additional lines. Current customers include paint, grease and oil field service industries.—Tom Rullman, P. O. Box 543, Oklahoma City 1, Okla.

TILING ENGINEER WANTED
Vinyl Asbestos or Vinyl

Excellent opportunity for man having at least two or three years experience. Liberal Pension & Hospitalization program. Location Midwest.

P9476 Chemical Week
520 N. Michigan Ave. Chicago 11, Ill.

CHEMIST and/or CHEMICAL ENGINEER

Experienced in plastic coating textile fabrics (cast coating). Probably will head department. Excellent Company—pays fee. Salary to $8000.

PAIR PERSONNEL SERVICE
Technical Division,
Member Nat'l. Employment Board
310-314 Forsyth Bldg., Atlanta 3, Ga.

TO REACH

V. I. P.'s

in the chemical process industries, you can use this Section. The rates are low $1.80 a line or $19.50 a column inch. Closing date is Tuesday for the issue dated Saturday a week later.

DESIGN ENGINEERS

PIPING LAYOUT, STRUCTURAL STEEL, CONCRETE, PROCESS HEATERS, EQUIPMENT SPECIFICATIONS, LAYOUT AND PROCESS DESIGN. ALSO PIPING AND ELECTRICAL DRAFTSMEN.

You can fill a desirable *permanent* position in McKee's enlarged Refinery, Metals or Industrial Divisions. Our expansion program gives you excellent opportunity for advancement in one of the world's largest engineering firms.

World-wide McKee operation offers you a broad field in the design of Petroleum Refineries, Chemical Plants, Blast Furnaces, Steel Plants, Sintering Plants and Industrial Plants.

You get top compensation, the security of a life-long pension, paid vacations, benefits of insurance, hospitalization, sick-leave pay and training program.

You'll work with modern equipment in large air-conditioned quarters. Free parking on premises.

Cleveland has attractive residential areas, excellent schools and colleges for you and your family. McKee makes generous transportation and moving allowances.

Write for an interview giving education and experience. No age limitations. All letters kept strictly confidential. Write today to:

Edward A. Kolner

ARTHUR G. McKEE & COMPANY

2300 Chester Avenue
Cleveland 1, Ohio

BUYER — EQUIPMENT AND CONSTRUCTION

Large internationally known chemical manufacturer has highly desirable opening with opportunity for growth available to a young man having industrial experience in the procurement of equipment and construction items. Requires engineering degree or equivalent experience plus good negotiating ability. New York City location. Some travel necessary. Please submit detailed resume and salary desired. All replies held in strict confidence.

P1005 Chemical Week
330 W. 42 St., New York 36, N.Y.

ADMINISTRATIVE ASSISTANT—PURCHASING

Leading chemical manufacturer has attractive opening for young man with experience in industrial organization, practices and procedures. Some technical and personnel background desirable. Please submit detailed resume and salary desired. All replies held in strict confidence.

P1008 Chemical Week
330 W. 42 St. New York 36, N. Y.

COMMERCIAL DEVELOPMENT

PROJECT MANAGER **MARKET & ECONOMIC ANALYST**

Specific opportunities in sound and rapid growth fields. Full range of commercial development responsibility—technical, promotional, economic. Functions fully supported and complemented by other Departments.

Permanent and convenient Philadelphia location—modern offices—liberal benefits.

Project Manager—Require man with B.S. or Ch.E., and minimum of five years, preferably eight, in chemical industry, predominantly INORGANIC development or sales field accomplishment and experience.

Market & Economic Analyst—Require man with Ch.E. or B.S. preferably also MBA or equivalent. Four years industrial experience, of which minimum of two in chemical market research, process economics, or related. Need broad and balanced field experience.

Please submit complete resume, including salary requirements, in first letter for confidential handling to:

Pennsalt Chemicals

COMMERCIAL DEVELOPMENT DEPARTMENT
TECHNICAL DIVISION

PENNSYLVANIA SALT MANUFACTURING COMPANY
THREE PENN CENTER PLAZA—PHILADELPHIA 2, PA.

CHEMICAL PROJECT ENGINEER

Opening available for any engineering graduate with minimum three to seven years' chemical or petroleum plant experience. Should be able to design processes and select equipment; estimate work construction costs and to supervise equipment installation and initial start-up. We offer excellent advancement opportunity in a synthetic resin plant undergoing multi-million dollar expansion program located in beautiful New England community. Send résumé and salary requirements to

P 8943 Chemical Week
330 W. 42 St., New York 36, N.Y.

RESEARCH CHEMISTS AND PRODUCTION ENGINEERS

New openings available for graduate chemists and for production engineers in a nationally expanding chemical manufacturing concern. We are noted for promotion from within policies, progressive management, financial stability, good salaries and excellent benefit programs. Men we seek must be creative, enthusiastic workers with good technical training and experience. Recent graduates considered. Relocation expenses paid. Send resume and salary requirements to P9593 Chemical Week 330 W. 42 St., New York 36, N. Y.

FLOOR TILE CHEMIST

Wanted

Experienced manufacture vinyl tile. Insurance, Hospitalization, and retirement. Replies treated confidentially.

P9479 Chemical Week
520 N. Michigan Ave. Chicago 11, Ill.

NEW POSITION

Opening for research biochemist with well established Marine By-Products Manufacturer. M.S. degree with experience in protein chemistry desired. Salary open.

P1031 Chemical Week
330 W. 42 St., New York 36, N.Y.

TRACERS

to opportunities in the chemical processing industries

- Aminopyrine
- Aspirin
- Methyl Salicylate
- Cyanomethine (2.6 Dimethyl & 4-Aminopyrimidine)
- Phthalazone (1-Oxyphthalazone)
- Full line of Salicylates
- Chemicals made to order

INQUIRIES INVITED
Please Write, Wire or Phone
SIMPSON LABORATORIES
120 Wall St., New York 5, N. Y.
WHitehall 3-1600

SURPLUS CHEMICALS WANTED
Chemicals—By-Products—Plasticizers
Pigments — Resins — Solvents
CHEMSOL, INC.
70 Dod Street, Elizabeth, N. J. EL 4-7654

SURPLUS WANTED
CHEMICALS, PHARMACEUTICALS, OILS
PLASTICIZERS, RESINS, DYES
SOLVENTS, PIGMENTS, ETC.
CHEMICAL SERVICE CORPORATION
96-02 Beaver Street, New York 5, N. Y.
HAnover 2-6970

BUYERS OF SURPLUS
CHEMICALS—OILS—SOLVENTS
DRUGS—RESINS—WAXES
PLASTICS—COLOR—ETC.
BARCLAY CHEMICAL COMPANY, INC.
75 Varick Street New York 13, N. Y.
WORTH 4-5120

NATIONALLY KNOWN MANUFACTURER
embarking on diversification program seeks to purchase for cash, exchange of stock or merge with business doing over $1,000,000. annually. Replies held in strict confidence.
B09577 Chemical Week
330 W. 42 St. New York 36, N.Y.

For Sale

Dryers, Rotary, Hot Air, 5' 6" dia. x 50' long. Perry, 1415 N. 6th St., Phila 22, Pa.

Marco Flow-Master Automatic Processing line including Roto-Feed Mixers, KACR Reactor, Kom-Bi-Nator, Homogenizer, Feeder and Pumps. Perry, 1415 N. 6th St., Phila. 22, Pa.

Stainless Steel Spray Dryer 19' dia. x 20' high. Now installed in Camden, N. J. Perry Equip., 1415 N. 6th St., Phila. 22, Pa.

DON'T FORGET
the box number when answering advertisements. It is the only way we can identify the advertiser to whom you are writing.

MANAGEMENT SERVICES

ARIES
New Products & Processes
Technical & Economic Surveys—Market Research Diversification Studies—New Product Suggestion Licensing of Processes on a Guaranteed Basis Evaluation and Expansion Reports to Management
R. S. ARIES & ASSOCIATES
270 Park Ave., New York 17, N. Y.

Clark Microanalytical Laboratory
Routine analyses in one week
CH, N, S, Halogen, Fluorine, Oxygen, Alkoxyl, Alkimide, Acetyl, Terminal Methyl, etc. by specialists in organic microchemical analysis.
HOWARD S. CLARK, DIRECTOR
P. O. Box 17 Urbana, Ill.

FOOD RESEARCH LABORATORIES, INC.
Founded 1922
Research • Analyses • Consultation
Chemical, Nutritional, Toxicological Studies for the Food, Drug and Allied Industries
48-14 33rd Street
Long Island City 1, N.Y.

THE C. W. NOFSINGER COMPANY
Personalized Engineering Service
PETROLEUM REFINING AND CHEMICAL INDUSTRIES
- Surveys—Planning—Process Design
- Engineering Design—Drafting—Procurement
- Supervision of Construction and Operation

906 Grand Avenue, Kansas City 6, Missouri

JAMES P. O'DONNELL
Engineers
Professional Engineering for the Petroleum and Process Industries
39 Broadway New York City
Bowie Bldg. Beaumont, Texas

SIRRINE
ENGINEERS
Plant Design & Surveys covering Chemical Electrochemical and Metallurgical Production; Industrial Waste Disposal; Water Supply & Treatment; Analysis & Reports
J. E. SIRRINE CO.
Greenville South Carolina

TECHNICAL ENTERPRISES, Inc.
Engineers—Consultants—Chemists
to
Chemical—Food—Pharmaceutical Industries
Complete Engineering Services
Product & Process Research & Development
SPECIALISTS IN
SMALLER MANUFACTURING PLANTS
31 South St., New York 4, N. Y. WH 8-1544

Wisconsin Alumni Research Foundation
Project Research Consultation and Production Control Service in Biochemistry, Chemistry, Bacteriology, Pharmacology, and Insecticide Testing and Screening.
Write for price schedule
Wisconsin Alumni Research Foundation
P.O. Box 2059-G • Madison 1, Wisconsin

SPECIALTIES . . . . .

shells, the usual abrasives used by furriers. Mortemoth Chemical Laboratories (Milwaukee) says its new method, called Lightning Furlife Fur and Lining Cleaner, has the approval of the synthetic pile manufacturers.

•

Imported Inhibitor: From England comes a new vapor-pressure corrosion inhibitor called Akrode, made by Howards of Ilford. U. S. sales agent (Baird Chemical Corp., New York) claims the inhibitor's great volatility and "throwing power" makes it possible to store precision equipment indefinitely, ready for use without cleaning (if packed in sealed containers). Likewise benefiting from the preserver of ferrous metals are steel cans for latex paint, razor blades, machine tools.

•

Potting Epoxy: Hysol 6600, a new epoxy from Houghton Laboratories, Inc. (Olean, N.Y.), is specially designed for use in potting and encapsulating large metal masses such as transformers and related equipment. A filled epoxy base, it is supplied as a soft solid, which melts to a low-viscosity liquid.

•

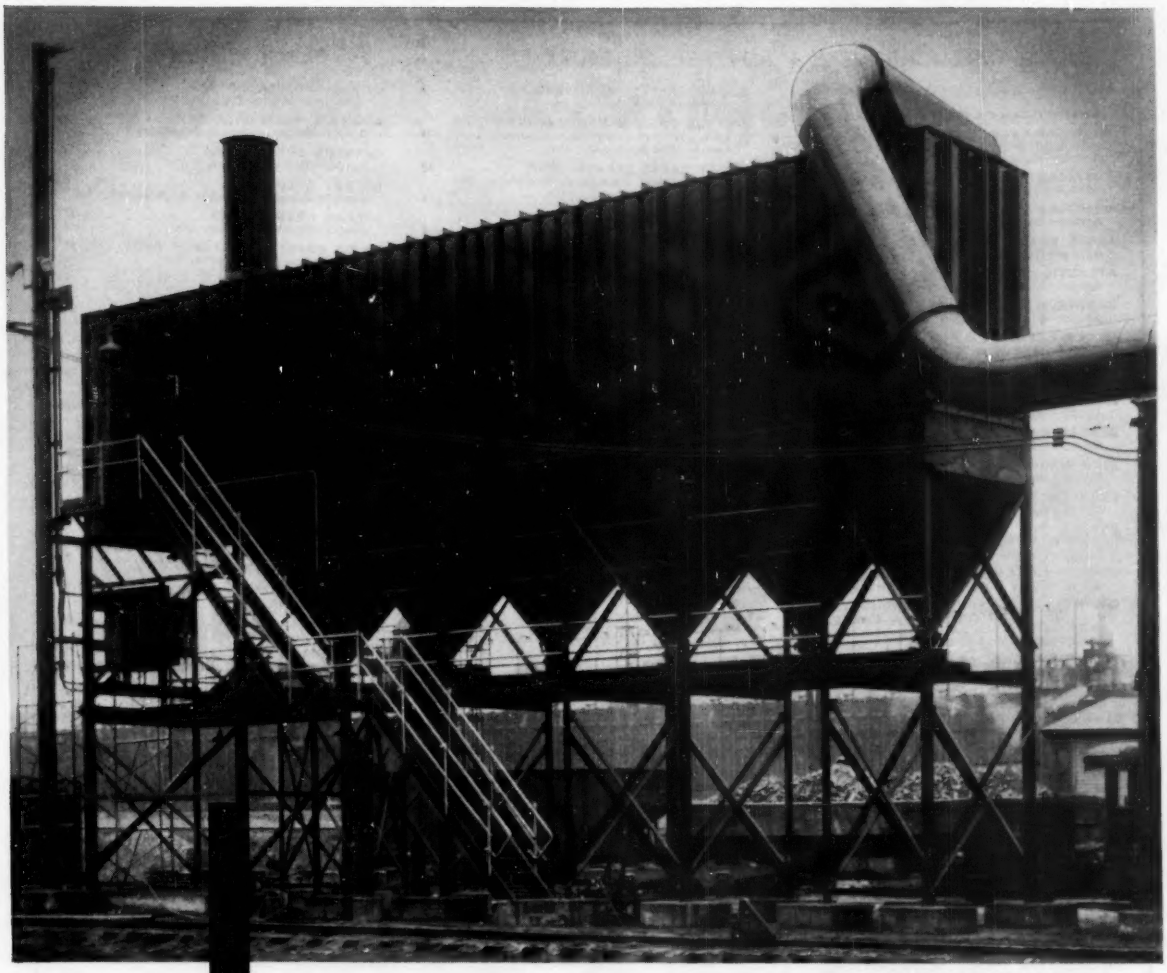
Add Five: Pabco Products Inc. (San Francisco) has introduced five new paint lines: (1) a thermoplastic-base emulsion coating formulated for use on mineral-surfaced shingles, rolled roofing and cap sheets; (2) a surface conditioner for use under exterior masonry paints, consisting of special drying and penetrating vehicles; (3) a clear resin sealer for use on new and unpainted or unsealed surfaces; (4) a multiservice vinyl finish for use on interior surfaces such as gypsum wallboard, plaster, stucco, brick and concrete and said also to be suitable for exterior painting; (5) deep-tone bases for use in Pabco-Tone Tube Color system.

EXPANSION. . . .

Third Time: Truly Magic Products Inc. (Buffalo, N.Y.) has opened its third plant—this one in Ft. Erie, Ont. The household cleaning supply maker has two locations in Buffalo.

•

Taking the Cap: Continental Can Co. has bought manufacturing and sales rights for polyethylene turret seal caps from Turret Seal Corp.



This Dracco Multi-Bag Filter at Jones & Laughlin Steel Corporation's Aliquippa (Pa.) Works is a complete unit with integral classifier and fan house. As a giant "safety device", its job is to . . .

"get the lead out!"

Jones & Laughlin Steel Corporation uses a Dracco Multi-Bag dust filter to keep its plant area free from toxic lead fumes which could endanger the health of workmen. These fumes are created at the pouring platform in the manufacture of leaded steel.

Lead, when added as pellets to molten steel, forms a suspension which acts as an internal lubricant to improve the machining quality of the steel. As the pellets are added during the pouring process, some of the lead volatizes.

To prevent escaping lead from polluting the plant atmosphere, dust intake hoods at the source trap 36,000 cubic feet of fume-laden air per minute. High efficiency of the Dracco Multi-Bag Filter assures 99½-100% fume recovery. Heavy-gauge steel construction of the filter unit makes it last longer with less upkeep.

Perhaps your plant has a dust problem causing product waste, abrasive wear to machinery or unhealthy working conditions. If so, it will pay to find out how Dracco methods can correct the situation and improve your plant efficiency. Write or call today!

DRACCO CORPORATION
4080 East 116th Street • Cleveland 5, Ohio

FREE! THE DRACCO ENGINEER. Describes Dracco solutions to many bulk materials handling and dust control problems—includes tips on improving plant efficiency . . . published quarterly. Get on the mailing list. Write on your letterhead today!

DRACCO *Performance Proved*
Airstream **CONVEYORS • DUST CONTROL EQUIPMENT**

CHEMICAL WEEK • ADVERTISERS INDEX

March 17, 1956

AMERICAN AGRICULTURAL CHEMICAL CO., THE 104
Agency—Donahue & Coe, Inc.

AMERICAN CYANAMID CO., PETRO CHEMICALS DEPT. 67
Agency—Hazard Adv. Co.

AMERICAN HARD RUBBER CO. 120
Agency—W. L. Towne Adv.

AMERICAN POTASH & CHEMICAL CORP. 115
Agency—The McCarty Co.

ANSUL CHEMICAL CO. 151
Agency—Kenyon & Eckhardt, Inc.

ATLANTIC REFINING CO. 57
Agency—N. W. Ayer & Son, Inc.

BADGER MANUFACTURING CO. 11
Agency—F. P. Walther Jr. & Assoc.

BAKER CHEMICAL CO., J. T. 6-7
Agency—Wildrick & Miller, Inc.

BAKER PERKINS, INC. 85
Agency—Price, Tanner & Willox, Inc.

BARNEBEY-CHENEY CO. 150
Agency—Byer & Bowman, Adv.

BERKSHIRE CHEMICALS, INC. 112
Agency—Givaudan Adv., Inc.

BIRD MACHINE CO. 61
Agency—Walter B. Snow & Staff, Inc.

BLAW-KNOX CO. 41
Agency—Ketchum, MacLeod & Grove, Inc.

BORDEN CO., CHEMICAL DIV., AMERICAN RESINOUS CHEMICAL CORP. ... 128
Agency—Bennett-Northrup, Inc.

BORDEN CO., CHEMICAL DIV. 2
Agency—Fuller & Smith & Ross, Inc.

CARBIDE & CARBON CHEMICALS CO., DIV. OF UNION CARBIDE & CARBON CORP. 47
Agency—J. M. Mathes, Inc.

CELANESE CORP. OF AMERICA 28-29, 147
Agency—Ellington & Co., Inc.

CHURCH & DWIGHT CO. 130
Agency—J. Walter Thompson Co.

CLARK EQUIPMENT CO. 94
Agency—Marsteller, Rickard, Gebhardt & Reed, Inc.

CROSSETT CHEMICAL CO. 124
Agency—Dan Goodrich Adv.

DAVIES NITRATE CO., INC. 124
Agency—Malcolm Severance Co.

DAVISON CHEMICAL CO. 4
Agency—St. Georges & Keyes, Inc.

DAY CO., INC., THE J. H. 96
Agency—Strauchen & McKim, Adv.

DIAMOND ALKALI CO. 58
Agency—Fuller & Smith & Ross, Inc.

DICALITE DIV., GREAT LAKES CARBON CORP. 122
Agency—Darwin H. Clark Co.

DISTILLATION PRODUCTS INDUSTRIES, DIV. OF EASTMAN KODAK CO. 5
Agency—Charles L. Rumrill & Co., Inc.

DORR-OLIVER, INC. 114
Agency—Sutherland-Abbott, Adv.

DOW CHEMICAL CO., THE 83
Agency—MacManus, John & Adams, Inc.

DOWELL, INC. 20
Agency—MacManus, John & Adams, Inc.

DRACCO CORP., THE 155
Agency—The Jayme Organization, Inc.

DU PONT DE NEMOURS & CO., INC., ORGANIC CHEMICALS DIV. ... 14-15, 143
Agency—Batten, Barton, Durstine & Osborn, Inc.

DURETHENE CORP., DIV. OF KOPPERS CO., INC. 64
Agency—The Vanden Co., Inc.

DURIRON CO., THE 31
Agency—Kircher, Helton & Collett, Inc.

EASTMAN CHEMICAL PRODUCTS, INC. 37
Agency—Fred Wittner, Adv.

EMERY INDUSTRIES, INC. 100
Agency—Ruthrauff & Ryan, Inc.

EMPIRE TRUST CO. 126
Agency—Doremus & Co.

FANSTEEL METALLURGICAL CORP. 66
Agency—Symonds, MacKenzie & Co., Inc.

FIRESTONE PLASTICS CO. 53
Agency—Grey Adv. Agency, Inc.

FOSTER WHEELER CORP. 103
Agency—Marsteller, Rickard, Gebhardt & Reed, Inc.

FRITZSCHE BROS., INC. 134

GENERAL AMERICAN TRANSPORTATION CORP., WIGGINS GASHOLDER DIV. ... 111
Agency—Weiss & Geller, Inc.

GENERAL ANILINE & FILM CORP. 93
Agency—L. W. Frohlich & Co., Inc.

GENERAL MILLS, INC. 108-109
Agency—Knox Reeves Adv., Inc.

GIRDLER CO., THE 33
Agency—The Griswold-Eshleman Co.

GLYCERINE PRODUCERS ASSOC. 87
Agency—G. M. Basford Co.

GOODYEAR TIRE & RUBBER CO. 1
Agency—Kudner Agency, Inc.

GRAVER TANK & MANUFACTURING CO. INC. 131
Agency—The Buchen Co.

GREAT LAKES CARBON CORP. 49
Agency—Davis, Parsons & Strohmeier, Inc.

GREEFF & CO., R. W. 126
Agency—The House of J. Hayden Twiss

GROSS & CO., A. 130
Agency—G. M. Basford Co.

GULF OIL CORP. 35
Agency—Young & Rubicam, Inc.

HARSHAW CHEMICAL CO., THE 149

HERCULES POWDER CO. 89
Agency—Fuller & Smith & Ross, Inc.

HEYDEN CHEMICAL CORP. ..... 4th Cover
Agency—Sommers-Davis, Inc.

HOOKER ELECTROCHEMICAL CO. 137
Agency—Charles L. Rumrill Co., Inc.

HUDSON PULP & PAPER CORP. 73
Agency—Ciangio Advertising, Inc.

INLAND STEEL CONTAINER CO. 125
Agency—Weiss & Geller, Inc.

INTERNATIONAL MINERALS & CHEMICAL CORP. 13
Agency—C. Franklin Brown, Inc.

KELLOGG CO., THE M. W. 10
Agency—Ellington & Co., Inc.,

KOLKER CHEMICAL CORP. 134
Agency—The House of J. Hayden Twiss

KOPPERS CO., INC. 141
Agency—Batten, Barton, Durstine & Osborn, Inc.

LINDE AIR PRODUCTS DIV. OF UNION CARBIDE & CARBON CORP. 113
Agency—J. M. Mathes, Inc.

LUMMUS CO., THE 16
Agency—G. M. Basford Co.

McKESSON & ROBBINS, INC. 136
Agency—Ellington & Co., Inc.

McLAUGHLIN GORMLEY KING CO. 112
Agency—The Alfred Colle Co.

MAAS CHEMICAL CO., A. R. 44
Agency—Heintz & Co., Inc.

MARATHON CORP. 144
Agency—Cormack-Imse-Beaumont, Adv.

MAYWOOD CHEMICAL WORKS 128
Agency—Charles W. Curts, Adv.

MERCHANTS CHEMICAL CO., INC. 123
Agency—G. M. Basford Co.

METAL & THERMIT CORP. 46
Agency—Baf Advertising, Inc.

METASAP CHEMICAL CO. 65
Agency—Lewin, Williams & Saylor, Inc.

MICHIGAN CHEMICAL CORP. 138
Agency—Wesley Aves & Assoc., Inc.

MISSOURI DIV. OF RESOURCES & DEVELOPMENT 88
Agency—B. J. Potts-Woodbury, Inc.

NATIONAL ANILINE DIV., ALLIED CHEMICAL & DYE CORP. 119
Agency—James J. McMahon, Inc.

NATIONAL PETRO CHEMICALS CORP. DIV. OF NATIONAL DISTILLERS PRODUCTS CORP. 50
Agency—G. M. Basford Co.

NIAGARA ALKALI CO. 42
Agency—Hazard Adv. Co.

NITROGEN DIV., ALLIED CHEMICAL & DYE CORP. 60
Agency—G. M. Basford Co.

PACIFIC COAST BORAX CO. 107
Agency—Howard M. Irwin & Assoc.

PENNSYLVANIA INDUSTRIAL CHEMICAL CORP. 30
Agency—Downing Ind. Adv., Inc.

PENNSYLVANIA SALT MFG. CO. OF WASHINGTON 3
Agency—The Condon Co., Adv.

PFAUDLER CO., THE 129
Agency—Charles L. Rumrill & Co., Inc.

PFIZER & CO., INC., CHAS. 63
Agency—MacManus, John & Adams, Inc.

PHILLIPS CO., THE THOMAS 101
Agency—McClure & Wilder, Inc.

PROCON, INC. 133
Agency—Sam J. Gallay, Adv.

PUBLICKER INDUSTRIES, INC. 116-117
Agency—Al Paul Lefton Co., Inc.

QUAKER OATS CO., THE CHEMICAL DIV. 8
Agency—Rogers & Smith, Adv.

RHODIA, INC. 145
Agency—The House of J. Hayden Twiss

ROHM & HAAS CO. 59
Agency—Arndt, Preston, Chapin, Lamb & Keen, Inc.

SHARPLES CHEMICALS, INC. 95
Agency—Sommers-Davis, Inc.

SHEA CHEMICAL CO. 48
Agency—Doe-Anderson Adv. Agency

SHELL CHEMICAL CORP. ..... 2nd Cover
Agency—J. Walter Thompson Co.

SINCLAIR CHEMICALS, INC. ..... 3rd Cover
Agency—Morey, Humm & Johnstone, Inc.

SPENCER CHEMICAL CO. 121
Agency—Bruce B. Brewer & Co.

SPERRY & CO., D. R. 92
Agency—Illinois Simmonds & Simmonds, Inc.

STEPAN CHEMICAL CO. 127
Agency—Frank C. Nahser, Inc.

UNION CARBIDE & CARBON CORP. 102
Agency—Anderson & Cairns, Inc.

U.S. RUBBER CO. 19
Agency—Fletcher D. Richards, Inc.

U. S. STEEL CORP., CHEMICALS DIV. .. 135
Agency—Batten, Barton, Durstine & Osborn, Inc.

U. S. TESTING CO. 9
Agency—Robert B. Grady Co.

VANDERBILT CO., R. T. 45
Agency—PS Advertising, Inc.

VICTOR CHEMICAL WORKS 77-89
Agency—Russel M. Seeds Co.

VITRO CORP. OF AMERICA 12
Agency—Molesworth Assoc.

VOGT MACHINE CO., HENRY 99
Agency—Farson, Huff & Northlich, Adv.

WESTVACO CHLOR-ALKALI DIV., FOOD MACHINERY & CHEMICAL CORP. 75
Agency—James J. McMahon, Inc.

WISCONSIN ALUMNI RESEARCH FOUNDATION 92
Agency—Arthur Towell, Inc.

WITCO CHEMICAL CO. 54-55
Agency—Hazard Adv. Co.

WOLF & CO., JACQUES 62
Agency—Riedl & Freede, Inc.

WYANDOTTE CHEMICALS CORP. 97
Agency—Brooke, Smith, French & Dorrance, Inc.

tracers SECTION

(Classified Advertising)

F. J. Eberle, Business Mgr.

CHEMICALS: Offered/Wanted 154

EMPLOYMENT ..... 152 & 153

EQUIPMENT: Used/Surplus New For Sale 154

WANTED 154

MANAGEMENT SERVICES 154

SPECIAL SERVICES 154

ADVERTISING STAFF

Atlanta 3 .....William Kearns, 801 Rhodes-Haverty Bldg., Walnut 5778-2383

Boston 16 .....350 Park Square Building Hubbard 2-7160

Chicago 11 .....Alfred D. Becker, Jr., Francis E. Stewart, 520 N. Michigan Ave., Mohawk 4-5800

Cleveland 15 .....Vaughn K. Dissette, 1510 Hanna Bldg., Superior 1-7000

Dallas 2 .....Gordon L. Jones, Adolphus Tower Bldg., Main & Ackard Sts., Prospect 7-5064

Detroit 26 .....856 Penobscot Bldg., Woodward 2-1793

London ....H. Lagler, McGraw-Hill House, 95 Farrington St., E.C. 4, England

Los Angeles 17 William C. Woolston, 1125 West Sixth St., Madison 6-9351

New York 36 .....Knox Armstrong P. F. McPherson, Charles F. Onasch, L. Charles Todaro, 330 West 42 St. LOngacre 4-3000

Philadelphia 3 ....William B. Hannum, Jr. Architects Bldg., 17th & Sansom Sts., RIttenhouse 6-0670

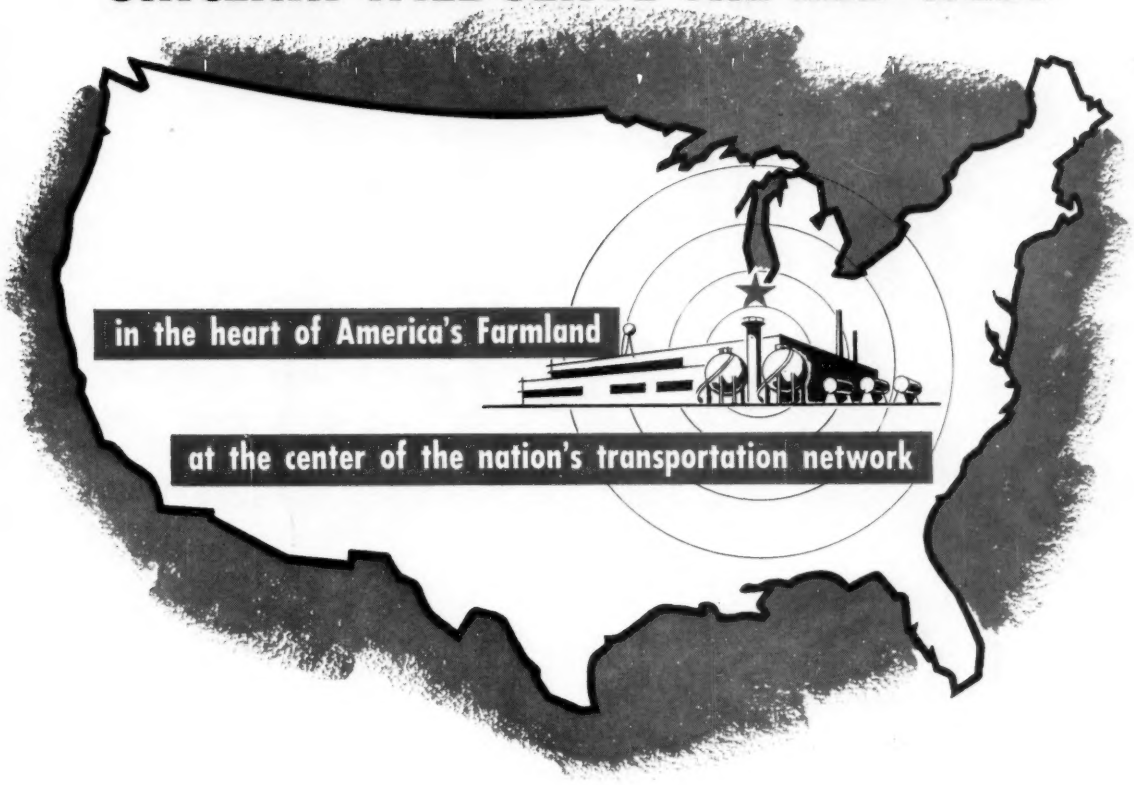
Pittsburgh 22 .....919 Oliver Bldg. Atlantic 1-4707

San Francisco 4 .....T. Evans Wyckoff, 68 Post St., Douglas 2-4600

St. Louis 8 .....3615 Olive St., Continental Bldg., Jefferson 5-4867

A new source for nitrogen chemicals

SINCLAIR WILL SERVE THE MID-WEST



Strategically located in Hammond, Indiana, this ultra-modern plant will soon be on stream – producing high purity anhydrous ammonia and nitrogen fertilizer solutions for agriculture and industry.

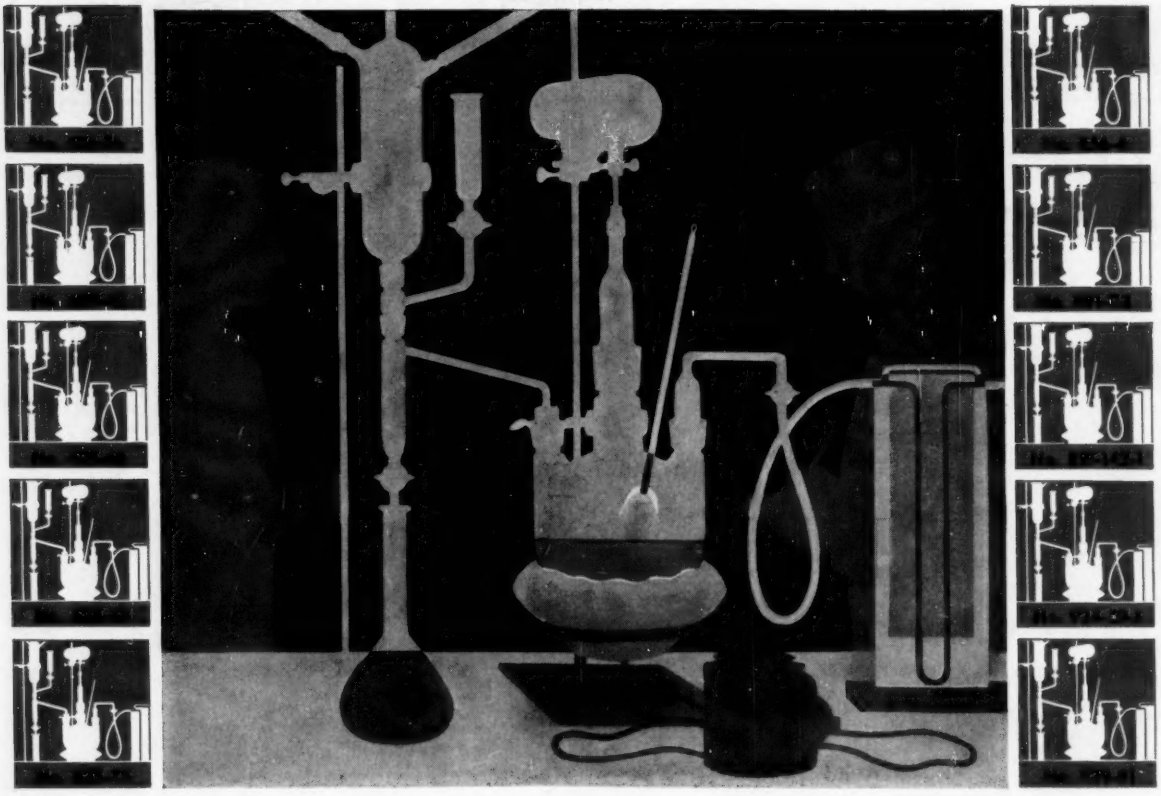
The central location of this plant is of prime importance to you. It means *fast, low cost delivery* of your nitrogen needs via Sinclair's fleet of tank cars and tank trucks. Moreover, vast storage facilities will enable Sinclair to supply you with top quality products during your busiest periods.

For further information about how this new plant can meet your nitrogen supply problems, phone or write . . .

SINCLAIR CHEMICALS, INC.

(Affiliate of Sinclair Refining Company)

600 Fifth Avenue, New York 20, N. Y. • Phone Circle 6-3600
155 North Wacker Drive, Chicago 6, Illinois • Phone Financial 6-5900



The more "cooks" the better!...

Let Heyden technical service help in your PE applications

Resins by the hundred have been cooked in our applications laboratory to provide data on the formulation, processing, and properties of pentaerythritol alkyds and other resins. This is an important part of Heyden's service and development work on PENTEK (pentaerythritol, technical) and its companion polyhydric alcohols.

Such information is available to you at all times from our technical and sales staffs. It could help you to convert a resin problem into a profitable product. Just call your nearest Heyden representative and tell him how he can be of service in your particular polyol application.

PENTEK® ... *the best known name in pentaerythritols*

Monopentek® • Dipentek® • Tripentek® • Pentaerythritol, Nitration Grade

HEYDEN
CHEMICAL CORPORATION
342 Madison Avenue, New York 17, N.Y.
CHICAGO • CINCINNATI • DETROIT • PHILADELPHIA • PROVIDENCE • SAN FRANCISCO

TME®
(Trimethylolethane)
For short and medium oil alkyds and for polyesters used in isocyanate resins.